Newtown Creek
Remedial Investigation Report[1] Appendix G (FMRM) Comment and Response Matrix

ID No.	Section Name/Topic	Section/Table/ Figure No.	Page No.	Reviewer Comment No.	Comment Text	Category	Response/Proposed Path Forward	EPA Comment (12/16/2019)
274	Appendix G FMRM	Model Codes/ Inputs/Outputs	--	G.M.1	The model codes/inputs/outputs transmittal includes what appears to be interpolated input files for the propwash submodel at varying frequencies (1, 2, 5, 10, and 15 seconds), of which the 15-second input was used for the majority of the simulation period from 1999 to 2012. However, the FMRM text does not mention the frequency of input. Revise the FMRM text to mention this.	Agree	Further description of the input files will be added to the FMRM and Model Transfer Memorandum.	The response is acceptable.
275	Appendix G FMRM	Model Codes/ Inputs/Outputs	--	G.M.2	The inputs for the propwash submodel uses 15-second inputs for the majority of the years and months. However, month 11 in year 2003 and month 12 in year 2009 use 2-second inputs. Revise the FMRM text to provide the rationale for this choice of inputs.	Agree	See response to Comment ID No. 274.	The response is acceptable.
276	Appendix G FMRM	Model Codes/ Inputs/Outputs	--	G.M.3	Review of model output files shows that average cohesive fraction (for each row of cells across Newtown Creek) at the end of the 1999–2012 calibration simulation in the first 0.2 mile of the Study Area is as little as 16%, which is inconsistent with the average measured cohesive content shown in Figure G5-22 (~80%). Revise the FMRM text to include a discussion of such differences between model and data, whether this is indicative of any artifacts in the model performance, and whether this can be expected to affect the performance of the CF&T model.	Agree	See response to Comment ID No. 281.	The response is acceptable.
277	Appendix G FMRM	Model Codes/ Inputs/Outputs	--	G.M.4	Review of the model code shows that morphological changes calculated due to erosion/deposition over the course of the model simulation are not propagated to the propwash model. However, such morphological changes are included in the Approximate Geomorphic Feedback Method implemented to adjust hydrodynamic forcings (bed shear stress) as a function of morphological change. One potential consequence of not having such a feedback in the propwash model is that erosional areas may continue to erode forever, and depositional areas may continue to deposit forever. Revise the model code to include such feedback in the propwash submodel and apply for the calibration simulations.	Agree	The model code will be revised to include the approximate geomorphic feedback method in the propwash model.	The response is acceptable. However, the NCG should also present and discuss model performance and diagnostics with EPA before finalizing and documenting the revised model.
278	Appendix G FMRM	General	--	G.G.1	There is a recurring typographical error in the text. The word settable is used instead of settleable. Review and revise.	Agree	The text will be revised as requested.	The response is acceptable.
279	Appendix G FMRM	General	--	G.G.2	Some analyses included in the attachments to Appendix G have not been referred to in the text in Section 5 of Appendix G. These include Attachment G-I and Section 1.2 of Attachment G-L. Revise the text in Section 5 of Appendix G to include a reference to these analyses and how these analyses have informed model development and application.	Agree	The text will be revised as requested.	The response is acceptable.

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280	Appendix G FMRM	General	--	G.G.3	Despite complexity and degrees of freedom, the propwash resuspension model has a negligible effect on model calculations of reach-scale NSRs, fine sediment bed content, and TSS. The calibration, validation, and relative importance of the propwash resuspension model (Section 5.5 of the updated FMRM) are overstated. A more apt statement is that on a reach-scale basis, propwash resuspension had a negligible effect on model-predicted NSRs, fine sediment bed content, and TSS. Given the number of assumptions and control variables inherent in the propwash resuspension submodel, calibration and validation of the submodel are not well constrained because the submodel effects are inconsequential to these reach-scale measures and are well within limits of data uncertainty and model uncertainty without propwash resuspension. Revise the text for a more balanced discussion of the parameterization, calibration, and relative importance of the propwash submodel.	Agree	The NCG agrees that the propwash model does not have a large effect on reach-scale NSRs, reach-scale fine sediment bed content, and reach-scale TSS. However, the propwash model does result in periodic sediment resuspension that has the possibility of affecting the CFT model. Preliminary long-term CFT modeling suggests that including the propwash model in the sediment transport model improves the accuracy of the CFT model. The text will be revised to clarify these topics and provide a more balanced discussion as requested following modifications to the propwash and sediment transport models per the response to Comment ID Nos. 277 and 281.	The response is acceptable.

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281	Appendix G FMRM	General	--	G.G.4a	While a tremendous amount of work has gone into the development of the sediment transport model, the values of certain parameters (e.g., settling velocity of the fine sediment size class) required the use of values that are not usually measured for flocculated sediments in estuarine waters. This, along with the issues described below, indicates that the sediment regime in the East River and Newtown Creek is not being correctly characterized. As such, the sediment transport model is subject to significant sources of uncertainty that can impact the chemical fate and transport model. The following two problems were also considered in arriving at this assessment. **Excessive sedimentation near the confluence of the East River and Newtown Creek** The propwash model was compiled in debug mode and then run for 5 years to ensure that no errors occurred. No compilation or run-time errors occurred. The sediment transport model was run in production mode using the NCG's continuous 1999–2012 run template. Analysis of the results showed that excessive sedimentation (approximately 2.3 meters of net deposition) was simulated to occur in the navigation channel near the mouth of Newtown Creek. Interestingly, this excessive sedimentation occurred in model runs both with and without invoking the hard-bottom assumption in the East River. In fact, the analysis performed showed that even more sedimentation is simulated to occur at the mouth when the model is run without the hard bottom. These results are not physically realistic and thus must result from the numerical scheme used to connect the East River and Newtown Creek. This unrealistic model result should be further investigated. In EPA's opinion, the impact of the excessive sedimentation on the long-term model future projection simulations cannot be estimated. As such, EPA's recommendation is that whatever is causing the excessive sedimentation at the mouth needs to be corrected because it is a numerically induced problem. It causes completely unrealistic results near the mouth of Newtown Creek and should not be ignored because of a seemingly minor impact on the CF&T model.	Agree	The sediment transport model will be revised to include a cohesive sediment class that has a settling velocity representative of flocculated sediment at the East River open boundaries. The NCG expects that this will result in transport of cohesive sediment further into Newtown Creek than the sand sediment class used in the 2019 FMRM version of the model. Because flocculated sediment is composed of fine particles, this modification to the sediment transport model will also increase the proportion of fine sediment on the bed near the mouth of Newtown Creek. This proposed modification to the sediment transport model will address multiple comments, including the following: • Predicted bed GSD near the mouth of Newtown Creek (Comment ID No. 276) • High rate of sedimentation at the mouth (Comment ID No. 281) • Lack of flocculated sediment in the model (Comment ID No. 281) Based on the results of diagnostic simulations used to examine the predicted sedimentation near the mouth of Newtown Creek, the NCG does not agree that the high rates of sedimentation near the confluence of the East River and Newtown Creek result from the numerical scheme. The high rate of sand sedimentation predicted near the mouth of Newtown Creek is a natural consequence of the sand content specified in the East River open boundary input and sand transport dynamics. Revision of the model input as described above will address the sedimentation rate issue discussed in this comment.	The response is partially acceptable. Because settling velocities are set equal to zero in the East River, sand transport dynamics is not being simulated in the East River. That is why EPA thinks that the excessive sedimentation at the mouth of Newtown Creek is a result of sand being transported as neutrally buoyant particles in the East River, and then all of a sudden a positive settling velocity is assigned to the sand classes when it enters in Newtown Creek. The sand settles rapidly because of the relatively high settling velocities, and this results in the excessive sedimentation at the mouth. EPA recommends simulating settling, deposition, erosion, and bedload processes in the East River in order to appropriately represent sand transport dynamics in the East River. The NCG should also present and discuss model performance and diagnostics with EPA before finalizing and documenting the revised model.

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282	Appendix G FMRM	General	--	G.G.4b	**Propwash Model** In general, the propwash model is a highly empirical and not thoroughly tested routine. As an example, one of the many empirical parameters included in this routine is H_PROP_TIP_MIN. This parameter seems to limit the distance between the bed and the propeller tip to the value of this parameter. Why was it necessary to add this empirical parameter that appears to minimize the impacts of propwash erosion? The uncertainties associated with the propwash model's predictions would be difficult to quantify. Thus, the uncertainty that is carried forward from the sediment transport model to the CF&T model is mostly unknown. This needs to be considered when ultimately interpreting the results from the bioaccumulation modeling. The testing that the NCG has initiated to investigate the impact of not having the morphologic feedback activated in the propwash model on the CF&T model is essential and should be thoroughly reviewed by EPA. Revise the text to include additional detail on how the settling velocity inputs were established, how it compares to values in similar systems, how it compares to literature values, how it compares to the settling velocities of primary particles estimated from the water column GSD data measured in Newtown Creek, and if any bias exists, how it may impact the CF&T model. Similarly, revise the text to include a discussion of the uncertainties in the propwash model described above and in the specific comments and how these uncertainties may impact the CF&T model.	Agree	The NCG agrees that portions of the propwash model are empirical, with some parts based on professional judgment. The text will be revised following the modifications to the propwash model (per the response to Comment ID Nos. 277 and 281) to discuss these aspects of the propwash model. Further documentation of the specification of parameter values and uncertainties in the propwash model will also be added to the text.	The response is acceptable. The NCG should also present and discuss model performance and diagnostics with EPA before finalizing and documenting the revised model.
283	Appendix G FMRM	Section 1.2	4	G.S.1	Page 4, Section 1.2 Study Objectives, third bullet in list at top of page: Revise the list to include other sources included in the CF&T model such as ebullition and the implicit loadings from subsurface NAPL.	Agree	The text will be revised as requested.	The response is acceptable.
284	Appendix G FMRM	Section 1.3	4	G.S.2	Page 4, Section 1.3 Utility and Application of the Model, bullet list: Revise the list to include groundwater inflows since that source is included in the hydrodynamic model.	Agree	The text will be revised as requested.	The response is acceptable.
285	Appendix G FMRM	Section 2.1.1	7	G.S.3	Page 7, Section 2.1.1 Overall Modeling Framework, first complete bullet, second-to-last sentence: The phrase diagnostic analysis at the end of the sentence seems to be a typographical error. Review and edit as appropriate.	Agree	The text will be revised as requested.	The response is acceptable.
286	Appendix G FMRM	Section 2.1.1	7	G.S.4	Page 7, Section 2.1.1 Overall Modeling Framework, second complete bullet, last sentence: Revise the list to include other sources included in the CF&T model such as ebullition and the implicit loadings from subsurface NAPL.	Agree	The text will be revised as requested.	The response is acceptable.
287	Appendix G FMRM	Section 2.1.4	10	G.S.5	Page 10, Section 2.1.4 Sediment Transport Model, third sentence in third paragraph: Revise the reference to the 2016 FMRM model to include the 2019 FMRM model.	Agree	The text will be revised as requested.	The response is acceptable.
288	Appendix G FMRM	Section 3.5.1	33	G.S.6	Page 33, Section 3.5.1 Diagnostic Analysis of 2015 Geo-Neutral Point Source Model, second paragraph, fourth sentence: "The annual rainfall measured at this station for the 27-year period from 1990 to 2015…" Measurements are of total precipitation, not just rainfall. Revise accordingly. Also revise the duration to 26 years.	Agree	The text will be revised as requested.	The response is acceptable.

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289	Appendix G FMRM	Section 3.5.1	33	G.S.7	Page 33, Section 3.5.1 Diagnostic Analysis of 2015 Geo-Neutral Point Source Model, second paragraph, fifth sentence: "The average annual rainfall at LGA…" should be average annual precipitation. Revise accordingly.	Agree	The text will be revised as requested.	The response is acceptable.
290	Appendix G FMRM	Section 3.5.1	33	G.S.8	Page 33, Section 3.5.1 Diagnostic Analysis of 2015 Geo-Neutral Point Source Model, second paragraph, fifth sentence: "The average annual rainfall at LGA for the 5-year period evaluated in the diagnostic analysis (2008 to 2012) was 47.2 inches per year, with minimum and maximum values of 36.2 and 65.3 inches per year in 2012 and 2011, respectively." It should be noted that these are statistics for the hourly dataset, which has deficiencies relative to the daily dataset. The 5-year average in the daily dataset was 47.4 (ftp://ftp.ncdc.noaa.gov/pub/data/ghcn/daily/all/USW00014732.dly). The 2012 total was 36.7, not 36.2. In Table G3-1, the 2010 total also differs (40.6, not 40.3). Revise the text and Table G3-1 accordingly.	Agree	As suggested, the hourly precipitation data used to develop the point source model inputs will be scaled to equal the daily total precipitation, to alleviate any concerns related to deficiencies in the hourly data. To maintain consistency, this scaling to the daily precipitation will also be done for Central Park data used in the hydrodynamic model inputs. The text will be revised to describe the scaling of the hourly data, and precipitation totals in the text and tables will be updated.	The response is acceptable. However, it includes the implicit assumption that the hourly data are erroneous and therefore should be scaled. Deficiencies in the hourly data after 2005 occur on specific dates, such as 10/29/12 when the hourly record indicates 0.05" while the daily registers 0.54. Revise the text to also include the rationale for scaling the hourly data rather than adjusting the daily data.
291	Appendix G FMRM	Section 3.5.1	36	G.S.9	Page 36, Section 3.5.1 Diagnostic Analysis of 2015 Geo-Neutral Point Source Model, second full paragraph, second and third sentences: "…13% of the precipitation for the entire watershed falls on these subbasins." "If 75% of the rainfall on the stormwater and direct drainage subbasins is discharged to the creek, then that volume of water would represent 11% of the total rainfall for the entire watershed." 13% × 75% = 10%, not 11%. Revise the text accordingly.	Agree	The text will be revised as requested.	The response is acceptable.
292	Appendix G FMRM	Section 3.6	37	G.S.10	Page 37, Section 3.6 Model Application, second paragraph, second sentence: Average precipitation for 1999 to 2012 is 46.0 inches as stated in the hourly dataset but was 47.2 inches in the daily dataset. Hourly datasets are notably deficient nationwide from about 1996 to 2005, corresponding with the early years of the automated surface observing system (ASOS) program. For this period, average annual precipitation in the hourly dataset was 43.6 versus 45.6 inches in the daily dataset. Simulations based on LGA hourly data should first include quality control and adjustment to ensure agreement with the daily dataset. Revise accordingly.	Agree	See response to Comment ID No. 290.	The response is acceptable.
293	Appendix G FMRM	Section 3.6	37	G.S.11	Page 37, Section 3.6 Model Application: Explain why the 23-year period from 1990 to 2012 is referenced. Figure G3-19 shows annual precipitation for 1990 to 2015. It is confusing enough to report statistics for 1999 to 2007, 1999 to 2012, and 2008 to 2012 without needing to also include this 23-year period. Explain why the 23-year period is needed.	Agree	The text will be revised as requested.	The response is acceptable.
294	Appendix G FMRM	Section 3.6	38	G.S.12	Page 38, Section 3.6 Model Application, equation G-1: Identify the units for ETP and RA.	Agree	The text will be revised as requested.	The response is acceptable.
295	Appendix G FMRM	Section 3.6	39	G.S.13	Page 39, Section 3.6 Model Application, first paragraph: "The Hargreaves and Samani (1985) paper also provides the equations for the calculation of the extraterrestrial radiation as a function of the time of day and latitude." Day should be replaced with year. Explain if the daily PET values were used as inputs to the model. Revise accordingly.	Agree	The text will be revised as requested.	The response is acceptable.

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296	Appendix G FMRM	Section 3.6	39	G.S.14	Page 39, Section 3.6 Model Application, first paragraph: Text says that evapotranspiration is 34.9 inches. Our calculation indicates 35.9 inches per year using the Hargreaves equation as implemented in EPA stormwater management model (SWMM) 5.1.013, with an annual range from 3 to 38 inches. Check the calculation and revise the text accordingly.	Agree	Calculations will be verified, and the text will be revised as appropriate.	The response is acceptable.
297	Appendix G FMRM	Section 3.7.1	39	G.S.15	Page 39, Section 3.7.1 Specification of Sensitivity Simulation Scenarios; Section 3.7.2 Sensitivity Simulation Results; Section 3.9 Conclusions; Tables G3-5 and G3-6; and Figures G3-35 to G3-39: Through an input sensitivity analysis, the draft RI characterizes the variability in point source model outputs associated with user-defined changes to model inputs. The sensitivity analysis does not constitute an uncertainty analysis. Further, it is unclear how the reported ± 25% effect of the parameterization of the geo-neutral point source model on discharge volumes was obtained from the input sensitivity analysis presented.	Agree	The text will be revised to clarify how the ±25% was determined from the sensitivity analysis. Text in Appendix G, Section 5.4.3.2, and Appendix E, Sections 4.1.1, 4.3, and 6, will be revised to state that this ±25% value is based on a sensitivity analysis—not a quantification of uncertainty.	The response is acceptable.
298	Appendix G FMRM	Section 3.7	39	G.S.15a	In Section 3.7, as referenced in Sections 4.1.1 and 4.3 of Appendix E, the referenced Section 3.7 presents a sensitivity analysis to user-defined changes to model inputs, not a quantification of uncertainty in the model. The conclusions of the sensitivity analysis as presented in Sections 3.7 and 3.9 of Appendix G, Table G3-5, and Figures G3-35 to G3-39, indicate that variations of the model inputs for rainfall source, runoff coefficient, and sanitary inflow yielded + 30% variation (not uncertainty) in predicted annual discharge volume (Appendix G, page 42 and page 46). This result does not agree with a report of 25% uncertainty in Appendix E on pages 49, 74, and 84. Reporting of point source model input sensitivity analysis results should be consistent between Appendix E and referenced sections of Appendix G both in terms of reported percentages and most importantly for correct characterization as variation rather than uncertainty	Disagree	The 30% variation from Table 3-6 is based on English Kills only, while the 25% variation is based on all CSOs. The use of 25% is consistent between Appendices E and G. As indicated in the response to Comment ID No. 297, the text will be revised to describe that this ±25% value is based on a sensitivity analysis rather than an uncertainty analysis.	The response is acceptable.
299	Appendix G FMRM	Section 3.7	42	G.S.15b	On page 42, a statement is made that variation in runoff coefficient between 0.4 and 0.6 on the low end instead of 0.5 (input variation of ± 20% on the low end) and between 0.6 and 0.8 instead of 0.7 on the high end (input variations of ± 14% on the high end) caused annual discharge volume for total point source discharge to vary by approximately 25%. If this is the result upon which statements in Appendix E on pages 49, 74, and 84 are based, that should be identified in Appendix E. Table G3-6 suggests this result is most descriptive of variation in sitewide CSO annual discharge volume. The draft RI should include a detailed explanation of the evaluation that produced the 25% result to allow for transparency, reproducibility, and assessment; otherwise, the claim of a 25% result should be removed from Appendix E Section 4.1.1 on page 49, Section 4.3 on page 74, and Section 6 on page 84.	Agree	Text in Appendix E will be revised to clarify the analysis used to estimate the ±25% value.	The response is acceptable.
300	Appendix G FMRM	Section 4.2.3	52	G.S.16	Page 52, Section 4.2.3 Temperature and Salinity Data, first paragraph in section: There is a discrepancy for the height of the near-bottom sonde described as 1 foot in the text and as 2 feet in Tables G4-5, G4-7, and G4-9. Review and edit as appropriate.	Agree	This section will be revised to resolve this discrepancy.	The response is acceptable.
301	Appendix G FMRM	Section 4.4.2.1	57	G.S.17	Page 57, Section 4.4.2.1 Water Surface Elevation: Describe if the water surface elevation results from the regional model were evaluated against measured water levels at the Battery and Horns Hook (location of the northern boundary) and, if so, the results of this evaluation.	Agree	The text will be revised to include a description of the regional model to data comparison at The Battery.	The response is acceptable.

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302	Appendix G FMRM	Section 4.4.3.2	59	G.S.18	Page 59, Section 4.4.3.2 Whale Creek WWTP Treated Effluent Overflow, second-to-last sentence in section: The sentence characterizes the WWTP discharge as primarily due to runoff from the watershed due to rainfall. Revise the text to indicate that the discharge represents treated effluent rather than runoff.	Agree	The text will be revised as requested.	The response is acceptable.
303	Appendix G FMRM	Section 4.5	60	G.S.19	Page 60, Section 4.4.5 Groundwater Inflow, last sentence: While it is true that setting negative groundwater inflow to zero has negligible effects on hydrodynamic model predictions, it is unclear how this inflow into the sediment bed will affect the chemical fate model. Add text indicating that this effect will be considered during CF&T model development.	Agree	The text will be revised as requested.	The response is acceptable.
304	Appendix G FMRM	Section 4.5.1	63	G.S.20	Page 63, Section 4.5.1 Calibration Data and Approach: This section discusses the calibration parameters in the model. It presents the final calibrated values for two parameters (bottom roughness and horizontal eddy diffusivity) but not the adjustment of water levels at the East River boundaries. For completeness, also present the magnitude of the adjustment applied as part of model calibration.	Agree	The text will be revised as requested.	The response is acceptable.
305	Appendix G FMRM	Section 4.5.3	66	G.S.21	Page 66, Section 4.5.3 Calibration Results, second sentence: The application of this definition is not clear because the conditions immediately prior to the point source discharges could vary spatially. Address this possibility in the text and indicate how this definition compares with the definition used in the CF&T model for model and data comparisons.	Agree	The text will be revised as requested.	The response is acceptable.
306	Appendix G FMRM	Section 4.5.3.3.1	68	G.S.22	Page 68, Section 4.5.3.3.1 Depth-Averaged Current Velocity: Because upward-looking ADCPs do not measure the entire water column profile (there is an unmeasured depth interval near the bottom of the water column and typically a depth interval corresponding to one bin near the surface), the measured profiles need to be extrapolated for an estimate of the depth average velocity. Revise the text to describe if this extrapolation was performed and, if so, the method used. If not extrapolated, then describe if/how the model results were processed for comparison against velocity averaged from the measured depth intervals.	Agree	The text will be revised as requested.	The response is acceptable.
307	Appendix G FMRM	Section 4.5.3.3.1	70	G.S.23	Page 70, Section 4.5.3.3.1 Depth-Averaged Current Velocity, second-to-last paragraph in section: Revise the text to mention if the bias and ubRMSD presented in Figures G4-44 and G4-45 are for the Phase 1, Phase 2, or both datasets.	Agree	The text will be revised as requested.	The response is acceptable.
308	Appendix G FMRM	Section 4.5.3.3.1	70	G.S.24	Page 70, Section 4.5.3.3.1 Depth-Averaged Current Velocity, last paragraph in section: Revise the text to include the rationale for not assessing model performance using target diagrams for the Phase 2 data. Alternatively, include graphics and text describing such comparisons.	Agree	Target diagrams for these Phase 2 data are provided in Attachment G-D. The text in this section will be revised to reference those figures.	The response is acceptable.
309	Appendix G FMRM	Section 4.5.3.3.1	70	G.S.25	Page 70, Section 4.5.3.3.1 Depth-Averaged Current Velocity, last paragraph in section: Model performance for a significant fraction of the comparisons included in the target diagrams for the 34-hour LPF depth-averaged currents in Figures G4-56 through G4-60 falls outside the radius of 1 described in Section 4.5.2 as the threshold within which model predictions are more accurate than simply assuming the mean of the observations. Revise the text to include a discussion of potential impact of these discrepancies on the long-term sediment and CF&T model performance.	Agree	The text will be revised as requested.	The response is acceptable.

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310	Appendix G FMRM	Section 4.5.3.3.2	71	G.S.26	Page 71, Section 4.5.3.3.2 Vertical Profile of Current Velocity, first complete paragraph on page and Figure G4-66 and G4-67: Review the figure as there are no data plotted after October 7. If the reason is the lack of data, consider showing a different period with model–data comparisons to demonstrate the points described in the text.	Agree	The text and figures will be revised as requested.	The response is acceptable.
311	Appendix G FMRM	Section 4.5.3.4	73-74	G.S.27	Pages 73-74, Section 4.5.3.4 Temperature: Low bias in modeled water temperature throughout Newtown Creek is likely associated with heat-flux calculations rather than temperature boundary conditions. Near the mouth of the creek, the elevation gradient specified between the East River open boundaries may account for the low bias in modeled temperature and the high bias in modeled salinity. The Newtown Creek hydrodynamic model-calculated water temperature is consistently biased low relative to data. The bias is attributed largely to specification of temperature at the model's northern open boundary, which was based on output from the regional hydrodynamic model. However, careful assessment of the Newtown Creek hydrodynamic model results for temperature and salinity identify two other important factors that should be discussed in the document:	Agree	The NCG agrees that the predicted water temperature is biased low and that some of the bias can be attributed to the temperature from the regional model being biased low and some can likely be attributed to the heat flux calculations. The text will be revised to include the heat flux calculations as another potential contributor to the low bias in the predicted temperature. Text will be revised to discuss potential implications of low predicted temperature and reference the diagnostic simulations, which indicate that the temperature has minimal effect on the sediment transport. Based on these diagnostic simulations, further refinement of the temperature calibration will not be conducted.	The response is acceptable.
312	Appendix G FMRM	Section 4.5.3.4	73-74	G.S.27a	While the northern temperature boundary condition obtained from the regional hydrodynamic model output is biased low by 1 to 2°C as compared to measurements at NYCDEP Harbor Survey Stations E2 and E4 in the lower East River, Figures G4-85 through G4-90 show that the low-temperature bias in the Newtown Creek hydrodynamic model increases notably from the creek mouth to the most upstream data station (EK108) in lower English Kills. This increasing low-temperature bias beyond the mouth of Newtown Creek cannot be attributed to the northern open boundary condition and indicates that the Newtown Creek hydrodynamic model's heat-flux calculations require adjustment. Either adjustments to the heat-flux calculation should be investigated or the document should indicate the potential role of the heat-flux calculation in the modeled temperature bias.	Agree	See response to Comment ID No. 311.	The response is acceptable.

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313	Appendix G FMRM	Section 4.5.3.4	73-74	G.S.27b	The Newtown Creek hydrodynamic model has two open boundaries, with temperature for the southern open boundary taken directly from National Oceanic and Atmospheric Administration (NOAA) data at the Battery. Thus, any low-temperature bias at the northern open boundary should be mitigated to some extent by data-based temperature conditions applied at the southern open boundary. In that regard, it has also been observed and remarked on at modeling meetings (see Figure G4-107) that model-predicted salinity near the mouth of Newtown Creek is biased slightly high (~ 0.5 to 1.0 practical salinity unit [psu]), suggesting too much influence of higher salinity water from the upper East River (N.B., the higher-salinity water actually originates in Long Island Sound). The relative influences near the mouth of Newtown Creek of temperature and salinity specified at the two model open boundaries is controlled by the static head difference between the two boundaries, specified in the model as a 3 cm increase in water-surface elevation at the northern open boundary. Thus, decreasing the head difference between the boundaries would decrease the net southward flux of water from the upper East River and might help to reduce both the low-temperature bias and the slightly high salinity bias near the mouth of Newtown Creek. The hydrodynamic model should be run with a decreased head difference between the boundaries.	Disagree	The Newtown Creek hydrodynamic model is using water temperature, salinity, and water level from the regional model at both the northern and southern open boundaries (Appendix G, Sections 4.1.2, 4.4.2.1, and 4.4.2.2), as agreed to (based on the discussion at the CFT Modeling Meeting No. 1 with USEPA on March 27, 2018) and documented in the memorandum from May 4, 2018. The head difference between the open boundaries was adjusted to better match residual currents in the East River, as agreed to (based on discussion at the CFT Modeling Meeting No. 1 with USEPA on March 27, 2018) and documented in the memorandum from May 4, 2018. The NCG will retain the method for specifying the hydrodynamic model open boundary conditions, as that was agreed upon at the in-person modeling meetings, because further adjustment will not materially affect predictions of sediment transport and CFT. As such, further refinement of the hydrodynamic model calibration will not be conducted. However, the text will be revised to discuss the effect of the salinity and temperature bias, as noted in the response to Comment ID No. 311. This response is consistent with the outcome of the phone discussion with USEPA on October 18, 2019, during which the USEPA verbally agreed that revisions to the hydrodynamic model calibration do not need to be made, provided the concerns raised in this and other comments on the hydrodynamic model are further discussed in the text.	The response is acceptable.
314	Appendix G FMRM	Section 4.5.3.4	74	G.S.28	Page 74, Section 4.5.3.4 Temperature, second-to-last paragraph in section: Model performance for the majority of the comparisons included in the target diagrams in Figures G4-95 through G4-106 falls outside the radius of 1 described in Section 4.5.2 as the threshold within which model predictions are more accurate than simply assuming the mean of the observations. Revise the text to include a discussion of the potential impact of these discrepancies on the long-term sediment and CF&T model performance.	Agree	See response to Comment ID No. 311.	The response is acceptable.

ID No.	Section Name/Topic	Section/Table/ Figure No.	Page No.	Reviewer Comment No.	Comment Text	Category	Response/Proposed Path Forward	EPA Comment (12/16/2019)
315	Appendix G FMRM	Section 4.5.3.5	75-77	G.S.29	Page 75-76 and 76-77, Section 4.5.3.5 Salinity: The hydrodynamic model salinity calibration suggests that groundwater discharge may have been underestimated, especially in upstream reaches of the creek. Model-predicted salinity is consistently biased high relative to data. In the draft RI, the bias is attributed to uncertainty in freshwater discharge from the geo-neutral point source model. However, the high salinity bias persists during prolonged intervals of dry weather when model results are not affected by point source discharge. Furthermore, the dry-weather high salinity bias increases slightly upstream from the creek mouth, suggesting a missing source of freshwater to the creek. Discuss the dry-weather bias in modeled salinity, including:	Disagree	Text will be revised to discuss bias in the predicted salinity as suggested. The hydrodynamic model is using data-based estimates of groundwater flow as inputs, which were developed based on the extensive collection of seepage meter and vertical hydraulic gradient measurements conducted as part of the Phase 2 RI and FS Part 1 field investigations. The NCG does not agree that it is appropriate to adjust the groundwater flow rates during calibration to be different than the data-based estimates. The NCG proposes to retain the groundwater inflow rates from the data-based estimates.	The response is acceptable. Also see response to comment ID no. 318
316	Appendix G FMRM	Section 4.5.3.5	75-77	G.S.29a	Figures G4-107 through G4-112 demonstrate that the model's 0 to 2 psu high salinity bias persists even during prolonged intervals of dry weather. Hence, this component of the bias cannot be attributed to uncertainty in the geo-neutral point source model. A 2 psu bias is significant and has the potential to affect residual circulation.	Disagree	The NCG agrees that this salinity bias cannot be solely attributed to the geo-neutral point source model. Diagnostic simulations indicate that this high salinity bias results largely from the use of the regional model predictions for the East River open boundary conditions (see Attachment G-E). Additional discussion of this salinity bias will be added to the text, but the boundary conditions will not be further adjusted as noted in the response to Comment ID Nos. 313 and 315.	The response is acceptable. Also see response to comment ID no. 318
317	Appendix G FMRM	Section 4.5.3.5	75-77	G.S.29b	It has been observed and remarked upon at modeling meetings (see Figure G4-107) that model-predicted salinity near the mouth of Newtown Creek is biased slightly high (~0.5 to 1.0 psu), suggesting too much influence of higher salinity water from the upper East River (N.B., the higher-salinity water actually originates in Long Island Sound). The relative influences near the mouth of Newtown Creek of salinity specified at the two model open boundaries is controlled by the static head difference between the two boundaries, specified in the model as a 3 cm increase in water-surface elevation at the northern open boundary. Decreasing the head difference between the boundaries would decrease the net southward flux of water from the upper East River and might help to reduce the slightly high salinity bias near the mouth of Newtown Creek. The hydrodynamic model should be run with a decreased head difference between the boundaries.	Disagree	As indicated in the response to Comment ID No. 313, the approach used to specify the water temperature, salinity, and water level from the regional model at both the northern and southern open boundaries was agreed to based on the discussion at the CFT Modeling Meeting No. 1 with USEPA on March 27, 2018. The head difference between the open boundaries was adjusted to better match residual currents in the East River. While decreasing the head difference could potentially reduce the salinity bias, it would reduce the accuracy of the residual currents. Given this tradeoff, the NCG will add additional text to discuss the reason for this bias, but further refinement of the hydrodynamic model East River open boundary conditions will not be conducted (see response to Comment ID No. 313).	The response is acceptable. Also see response to comment ID no. 318

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ID No.	Section Name/Topic	Section/Table/ Figure No.	Page No.	Reviewer Comment No.	Comment Text	Category	Response/Proposed Path Forward	EPA Comment (12/16/2019)
318	Appendix G FMRM	Section 4.5.3.5	75-77	G.S.29c	Figures G4-107 through G4-112 also indicate that the dry-weather high salinity bias increases slightly from creek mouth to head. The dry-weather biases at stations NC310 (CM 0.4) and NC313 (CM 1.5) are similar, approximately 0.5 to 1.0 psu. Stations NC316 (CM 2.25) and NC318 (CM 2.7) bracket the Turning Basin downstream and upstream, respectively. The high salinity biases at those two stations are similar and show a notable uptick from the two downstream stations (i.e., NC310 and NC313). East Branch station EB403 shows a further uptick in the dry-weather salinity bias relative to the Turning Basin stations, particularly near the water surface. A similar uptick is apparent at English Kills station EK108. The dry-weather high salinity biases at these two upstream stations (i.e., EB403 and EK108) are more consistently 2 psu or slightly higher. Taken together, these observations suggest a missing source of freshwater (or “fresher” water) to the model, with the influence of the missing freshwater increasing from mouth to head. A possible candidate for the missing water is a general underestimation of groundwater discharge or an overestimation of groundwater salinity. Hydrodynamic model simulations should be conducted to assess salinity results using increased groundwater discharge and decreased groundwater salinity. Vertical profiles of salinity measurements (Figures G4-130 and G4-131) at several stations show distinct lower-salinity surface layers 2- to 5-feet thick. While the potential implications of these data have not been fully assessed in the draft RI, comparisons of model results to these measurements implies that the model requires additional groundwater inflow to Newtown Creek, in general, and to East Branch and English Kills, in particular. Include a discussion of these points:	Disagree	As noted in the response to Comment ID No. 315, the NCG proposes to retain the groundwater inflow rates from the data-based estimates. The text will be revised to add additional discussion of the uncertainty associated with the specified salinity value of the groundwater inflow and the potential effect on predicted salinity during dry weather.	The response is acceptable. The NCG should also present model-data comparisons from the diagnostic simulations referred to in the response to comment ID no. 316 indicating that bias in salinity results largely from the salinity boundary condition in the East River. If these diagnostic simulations show a persistent bias at locations where the highest groundwater flows are already being applied, or at up-Creek locations even as results at more down-Creek locations match the data, the NCG should perform bounding simulations that incorporate uncertainty in groundwater flow rates and/or salinity.
319	Appendix G FMRM	Section 4.5.3.5	75-77	G.S.29c.a	Surface salinity for these layers was up to 50 to 80% lower than salinity below the halocline, indicating relatively strong salinity stratification. These fresher surface layers will induce estuarine circulation in which the fresher layer flows downstream at the surface and a more saline layer flows upstream at the bed. Model-predicted vertical salinity profiles at the same times and locations do not show this salinity stratification, indicating that the hydrodynamic model is missing this estuarine circulation. This will have implications to solids and chemical transport, which should be identified in the document.	Disagree	The text will be revised to discuss the model under-prediction of stratification; however, as noted in the response to Comment ID No. 315, further refinement of the hydrodynamic model calibration will not be conducted.	See EPA comment on response to comment ID no. 318
320	Appendix G FMRM	Section 4.5.3.5	75-77	G.S.29c.b	More important, the possibility that the fresher surface layers persist for longer periods of time (i.e., several days) should be considered. Given that the plot panels vary both by time and station location, the persistence of fresher surface layers cannot be fully ascertained from the figures. Nevertheless, the plots provided indicate that a substantial source of fresher water is missing from the model. This fresher water cannot be attributed to point source discharge because the salinity stratification persists at least 2 to 4 days after both rainfall and point source discharge have ceased. As indicated by the model’s response, the fresher surface water attributable to point source discharge will dissipate more quickly than this without the presence of a continuing source of fresher water. The implications of additional groundwater inflow to Newtown Creek, in general, and to East Branch and English Kills, in particular, deserve more consideration. Complete additional evaluations and incorporate them into the document.	Disagree	As noted in the response to Comment ID No. 315, the NCG proposes to retain the groundwater inflow rates from the data-based estimates. The text will be revised to add additional discussion of the fresher surface layers and the model under-prediction of stratification, as noted in the response to Comment ID No. 319.	See EPA comment on response to comment ID no. 318

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ID No.	Section Name/Topic	Section/Table/ Figure No.	Page No.	Reviewer Comment No.	Comment Text	Category	Response/Proposed Path Forward	EPA Comment (12/16/2019)
321	Appendix G FMRM	Section 4.5.3.5	75	G.S.30	Page 75, Section 4.5.3.5 Salinity, second complete paragraph: Revise the text to discuss the relatively large discrepancy between model and data in Figures G4-107 through G4-112, especially at the surface. The data seem to indicate the impact of a point source discharge event before 10/1/15, whereas the point source model calculates a discharge event only after 10/1/15. As a result, the hydrodynamic model only shows an impact, albeit smaller than the data, only after 10/1/15.	Agree	The text will be revised as requested.	The response is acceptable.
322	Appendix G FMRM	Section 4.5.3.5	76	G.S.31	Page 76, Section 4.5.3.5 Salinity, first complete paragraph: Model performance for the majority of the comparisons included in the target diagrams in Figures G4-117 through G4-128 falls outside the radius of 1 described in Section 4.5.2 as the threshold within which model predictions are more accurate than simply assuming the mean of the observations. Revise the text to include a discussion of potential impact of these discrepancies on the long-term sediment and CF&T model performance.	Agree	The text will be revised as requested.	The response is acceptable.
323	Appendix G FMRM	Section 5.1.2	81	G.S.32	Page 81, Section 5.1.2 2016 FMRM Refinements, first bullet: Since Primary Technical Issue No. 1 relates to the hydrodynamic model, move this bullet item to an appropriate place in Section 4.	Agree	The text will be revised as requested.	The response is acceptable.
324	Appendix G FMRM	Section 5.2.1	89	G.S.33	Page 89, Section 5.2.1 Multiple Lines-of-Evidence Approach for Evaluating Net Sedimentation Rates, bullet items: In addition to the two findings listed in the referenced text, as described in Attachment G-G, the geochronology analysis also shows the impact of changes in trapping efficiency on NSRs and the impact of propwash resuspension. Revise the text to include these insights.	Agree	The text will be revised as requested.	The response is acceptable.
325	Appendix G FMRM	Section 5.2.1	90	G.S.34	Page 90, Section 5.2.1 Multiple Lines-of-Evidence Approach for Evaluating Net Sedimentation Rates, second and third concluding bullets: The second sub-bullet for both referenced bullets attributes long-term temporal (50 to 75 years) changes in NSRs to only changes in point source loadings. However, the analysis in Attachment G-G also attributes changes in NSRs over this time period to changes in trapping efficiency. Revise the sub-bullets to also mention changes in trapping efficiency as a cause for changing NSRs, consistent with the analysis in Attachment G-G.	Agree	The text will be revised as requested.	The response is acceptable.
326	Appendix G FMRM	Figure G5-5	--	G.S.35	Figure G5-5: The figure does not show NSR in English Kills estimated from historical dredging records included in Attachment G-H. Revise the figure to either include NSR estimated from historical dredging records in English Kills or provide justification for excluding this estimate.	Agree	The text will be revised to explain why the NSR estimate for English Kills is not included in the figure.	The response is acceptable.
327	Appendix G FMRM	Section 5.2.2	91	G.S.36	Page 91, Section 5.2.2 Data-Based Mass Balance Analysis: The results of the sediment mass balance analysis described in this section and in Attachments G-I and G-L do not seem to be referenced anywhere else in the text. Revise the text to describe how the results of this analysis have been used to support model development and application and if this analysis can be cited as a line of evidence to support the robustness of the sediment transport model.	Agree	The text will be revised as requested.	The response is acceptable.
328	Appendix G FMRM	Section 5.2.2	92	G.S.37	Page 92, Section 5.2.2 Data-Based Mass Balance Analysis, second paragraph: Provide rationale/analyses to support the statement:" Most of the deposition in the upper tributaries is due to point source sediment loads."	Agree	The text will be revised as requested.	The response is acceptable.

ID No.	Section Name/Topic	Section/Table/ Figure No.	Page No.	Reviewer Comment No.	Comment Text	Category	Response/Proposed Path Forward	EPA Comment (12/16/2019)
329	Appendix G FMRM	Section 5.2.3	93	G.S.38	Page 93, Section 5.2.3 Bed Property Data, first paragraph in section: Provide the rationale for presenting TOC content data in the context of the sediment transport model.	Agree	This reference to TOC will be removed from the document.	The response is acceptable.
330	Appendix G FMRM	Section 5.2.4	95	G.S.39	Page 95, Section 5.2.4 TSS Concentration and Turbidity Data, bullet items at end of section and concluding sentence: EPA has previously commented on the TSS–turbidity relationship for the bulkhead sondes as part of the 2016 draft FMRM. Various potential artifacts were identified by EPA that have led to the apparent lack of a relationship between TSS and turbidity. These include fouling of the turbidity sensors, differences in the depth sampled by the turbidity sensor and the TSS water sample collection depth, and location artifacts where the water samples were collected in locations with depths somewhat different than at the sonde locations. Revise the text to mention the potential artifacts that have resulted in an apparent lack of relationship between TSS and turbidity.	Agree	The text will be revised as requested.	The response is acceptable.
331	Appendix G FMRM	Section 5.3	95	G.S.40	Page 95, Section 5.3 Development of Propwash Resuspension Submodel: Many aspects of the propwash resuspension submodel are uncertain, and additional effort would be required to address the uncertainty. The updated propwash resuspension submodel is complex and based on a number of assumptions, making it difficult to assess the value of the approach. Additional efforts should be made to explore the uncertainty of this submodel. Specific issues of concern include:	Agree	See response to Comment ID Nos. 332 through 339.	The response is acceptable.
332	Appendix G FMRM	Section 5.3.4	106	G.S.40a	Page 106, Section 5.3.4 Development and Calibration of Empirical Propwash Submodel: Calibration of the empirical propwash submodel takes a probabilistic approach to an assumed log-normally distributed applied power and attempts a qualitative "visual inspection" match between the model-calculated cumulative frequency distribution of UNB,max and the cumulative frequency distribution of UNB,max measured by acoustic doppler velocimeters (ADVs) at six stations (e.g., Figure G5-59 to G5-61). One could argue that the cumulative frequency distribution of UNB,max for a mean of 18% and a standard deviation of 20% (Figure G5-61) looks as good qualitatively as the selected calibration mean of 9% and standard deviation of 10% (Figure G5-59). Submodel sensitivity to these choices should be assessed.	Agree	Diagnostic simulations will be used to evaluate the sensitivity of the predicted NSRs to the choice of the ship power distribution, and the text will be revised as appropriate.	The response is acceptable.
333	Appendix G FMRM	Section 5.3.5	107	G.S.40b.i	Section 5.3.5, Specification of Propwash Resuspension Submodel Input Parameters: Page 107: Bulleted characteristics of hypothesized Period 1 and Period 2 both use the word "typically," and only a single time series of acoustic backscatter sensor (ABS)-based turbidity is presented (i.e., Figure G5-62). Present more clearly how typical durations of Period 1 and Period 2 were determined and provide supporting statistics.	Agree	Durations of Period 1 and Period 2 were determined visually based on professional judgment. The text will be revised to clarify this.	The response is partially acceptable. Revise the text to provide statistics for the duration of Period 1 and Period 2

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334	Appendix G FMRM	Section 5.3.5	108	G.S.40b.ii	Page 108: The general approach for characterizing propwash events is based on a bulleted assumption that "ABS-based turbidity values are a surrogate for suspended sediment concentration." However, FMRM Attachment G-F observed that R2 values for the ABS-turbidity correlations at the six ADV locations ranged from 0.15 to 0.66, suggesting that ABS-based turbidity values are a poor surrogate for suspended sediment concentration. Attachment G-F even concluded with a warning about the limitations of using the ABS-turbidity correlations. Present more clearly in Section 5.3.5 the potential limitations of the general approach to the propwash submodel.	Agree	The NCG agrees that the ABS-based turbidity cannot be used to accurately determine the magnitude of TSS. However, the approach used to characterize propwash events only assumes that the decay rate for the ABS-based turbidity is the same as the decay rate for the TSS during very short-term events at a single location. Thus, for any given propwash resuspension event, the ABS-based turbidity represents the relative change in sediment suspended in the water at that location and height above the bed over the duration of the event. It is this relative change throughout the duration of each event that is used to estimate the propwash parameters—not any absolute magnitude of TSS. The text will be revised to clarify this topic and the potential limitations of the assumption being made in this approach.	The response is partially acceptable. The comment also mentioned the relatively poor correlation between ABS and turbidity. Revise the text to also mention this issue and the potential implications on subsequent use of the turbidity time-series to infer propwash events.
335	Appendix G FMRM	Section 5.3.5	108-109	G.S.40b.iii	Pages 108-109: The propwash submodel asserts that Period 1 can be distinguished from Period 2 by an inflection point in slope of the ABS-based turbidity time series, and one example is presented graphically (i.e., Figure G5-63). Describe the quantitative method by which the position of the inflection point is determined.	Agree	See response to Comment ID No. 333.	The response is acceptable.
336	Appendix G FMRM	Section 5.3.5	109	G.S.40b.iv	Page 109: The empirical propwash submodel makes an assumption that t2-t1 = t1-t0, yet Figure G5-63 would suggest that t2-t1 is notably longer than t1-t0. Present the basis for the submodel assumption. How would submodel results vary if the assumption was modified; for example, t2-t1 = 2(t1-t0) or t2-t1 = 4(t1-t0)?	Agree	The text will be revised to clarify this topic.	The response is partially acceptable. The comment also asked for the impact of a different assumption on propwash model results. This can be accomplished using diagnostic analyses. The NCG should perform diagnostic simulations to assess the uncertainty in model performance related to this assumption.

ID No.	Section Name/Topic	Section/Table/ Figure No.	Page No.	Reviewer Comment No.	Comment Text	Category	Response/Proposed Path Forward	EPA Comment (12/16/2019)
337	Appendix G FMRM	Section 5.3.5	109	G.S.40b.v	Page 109: The empirical propwash submodel makes an assumption that 1% of Class 1C-fast sediment remains in the water column at the end of Period 1. Describe quantitatively the evidence supporting that assumption. How would the submodel results if that assumption was modified; for example, 5, 10, or 20% of Class 1C-fast sediment remains in the water column at the end of Period 1.	Agree	The text will be revised to clarify this topic.	The response is partially acceptable. The comment also asked for the impact of a different assumption on propwash model results. This can be accomplished using diagnostic analyses. The NCG should perform diagnostic simulations to assess the uncertainty in model performance related to this assumption.
338	Appendix G FMRM	Section 5.3.5	110	G.S.40b.vi	Page 110: In equation (G-26), what is the term “CABS,1C-total,0 ABS,1C-total,2”? Show the derivation of equation (G-26).	Agree	The equation will be revised as requested.	The response is acceptable.
339	Appendix G FMRM	Section 5.3.5	110	G.S.40b.vii	Page 110: Regarding the selected median values of Ws,1C-fast / Ws,1C-slow = 30 and 0F1C-slow = 50%, are these truly fundamental quantities of propwash resuspension in Newtown Creek or are they merely the consequence of the previous series of assertions and assumptions applied to the propwash resuspension submodel?	Agree	The text will be revised to clarify this topic.	The response is acceptable.
340	Appendix G FMRM	Section 5.3	95	G.S.41	Page 95, Section 5.3 Development of Propwash Resuspension Submodel, second-to-last bulleted item: While the effect of water depth and its impact on vessel draft is easily understood, the impact of tidal phase (ebb or flood) and dry or wet weather conditions on navigation scour is not apparent. Clarify how these two hydrodynamic conditions can impact navigation scour in Newtown Creek and how these have been accounted for in the development of the propwash resuspension model.	Agree	The text will be revised as requested.	The response is acceptable.
341	Appendix G FMRM	Section 5.3.2.2	99	G.S.42	Page 99, Section 5.3.2.2 AIS Data Analysis: Historical Data, last paragraph: There is a note explaining the term “ship-days” with reference to Figure G5-37. However, this term does not appear on Figure G5-37 but rather on Figure G5-34. Revise the text to provide explanation of this term in the context of Figure G5-34.	Agree	The text will be revised as requested.	The response is acceptable.
342	Appendix G FMRM	Section 5.3.4	104	G.S.43	Page 104, Section 5.3.4 Development and Calibration of Empirical Propwash Submodel, bullet items: In addition to the two sources of uncertainty listed in the bullets, include the uncertainty in the actual draft of the vessel described in detail on the second paragraph on the page as another source of uncertainty that affects the empirical propwash submodel.	Agree	The text will be revised as requested.	The response is acceptable.
343	Appendix G FMRM	Section 5.3.5	106	G.S.44	Page 106, Section 5.3.5 Specification of Propwash Resuspension Submodel Input Parameters, second-to-last sentence in first paragraph in section: The referenced sentence includes a reference to Attachment G-L for the ABS-turbidity correlations. This seems to be in error; the ABS–turbidity correlations are in Attachment G-F. Revise the text as appropriate.	Agree	The text will be revised as requested.	The response is acceptable.

ID No.	Section Name/Topic	Section/Table/ Figure No.	Page No.	Reviewer Comment No.	Comment Text	Category	Response/Proposed Path Forward	EPA Comment (12/16/2019)
344	Appendix G FMRM	Section 5.3.5	106	G.S.45	Page 106, Section 5.3.5 Specification of Propwash Resuspension Submodel Input Parameters, second paragraph in section: Revise the text to indicate if propwash events identified from the ADV data were correlated to resuspension events evident in the ABS-based turbidity data. In other words, did every propwash event also show evidence of resuspension? Comment on potential explanations for propwash events that did not induce resuspension.	Agree	The text will be revised as requested.	The response is acceptable.
345	Appendix G FMRM	Section 5.3.5	106	G.S.46	Page 106, Section 5.3.5 Specification of Propwash Resuspension Submodel Input Parameters, second paragraph in section: The wording in the first two paragraphs is confusing. It seems apparent that a propwash event would be caused by resuspension of sediment from the bed and a rapid increase in turbidity. Is this the definition that was used to determine the number of propwash events? On page 110, it states that there were 476 propwash events, yet only 34 of the events (that had adequate data) were used in the analysis. Revise the text to include more discussion of this difference.	Agree	The text will be revised as requested.	The response is acceptable.
346	Appendix G FMRM	Section 5.3.5	106	G.S.47	Page 106, Section 5.3.5 Specification of Propwash Resuspension Submodel Input Parameters, second paragraph in section: Based on text on page 110 (476 propwash events but only 34 events with evidence of resuspension following the conceptual picture shown in Figure G5-66), it does not appear that every propwash event induces resuspension. This is consistent with observations of vessel-induced resuspension in other systems. For instance, Clarke et al. (2015) found variable patterns of resuspension depending on vessel type and activity—tugs pushing barges did not induce resuspension, whereas tugs assisting ships in rotating and docking maneuvers appeared to induce resuspension. Similar variability was also noted for other vessels (deep-draft versus car carriers). Revise the text to include a discussion of this uncertainty in vessel-induced resuspension.	Agree	The text will be revised as requested.	The response is acceptable.
347	Appendix G FMRM	Section 5.3.5	107	G.S.48	Page 107, Section 5.3.5 Specification of Propwash Resuspension Submodel Input Parameters: The use of ABS-based turbidity data to determine two phases of a propwash resuspension event seems appropriate. Nevertheless, assumptions made during this analysis should be considered far from definitive (e.g., approximately 99% of Class 1C-fast sediment depositing during Period 1, sediment resuspended during an event is composed of only clay and silt-sized material). The result is a model or algorithm that contains a lot of unquantifiable uncertainty. This needs to be discussed in this section of the FMRM.	Agree	The text will be revised as requested.	The response is acceptable.
348	Appendix G FMRM	Section 5.3.5	107	G.S.49	Page 107, Section 5.3.5 Specification of Propwash Resuspension Submodel Input Parameters and Figure G5-63: For clarity, consider adding terms CABS,0, CABS,1, CABS,2, t0, t1, and t2 described in the text to Figure G5-63.	Agree	The figure will be revised as requested.	The response is acceptable.
349	Appendix G FMRM	Section 5.3.5	107	G.S.50	Page 107, Section 5.3.5 Specification of Propwash Resuspension Submodel Input Parameters, third paragraph: Revise the text to mention the assumption that all material resuspended by propwash and measured by the ABS-based turbidity is assumed to be comprised of clays and silts.	Agree	The text will be revised as requested.	The response is acceptable.
350	Appendix G FMRM	Section 5.3.5	108	G.S.51	Page 108, Section 5.3.5 Specification of Propwash Resuspension Submodel Input Parameters, first bullet: Revise the text to provide rationale or analysis justifying the assumption that 99% of Class 1C-fast settles out during Period 1.	Agree	See response to Comment ID No. 337.	The response is acceptable.

ID No.	Section Name/Topic	Section/Table/ Figure No.	Page No.	Reviewer Comment No.	Comment Text	Category	Response/Proposed Path Forward	EPA Comment (12/16/2019)
351	Appendix G FMRM	Section 5.3.5	109	G.S.52	Page 109, Section 5.3.5 Specification of Propwash Resuspension Submodel Input Parameters, first complete paragraph, second bullet, second sub-bullet: The assumption that the duration of Period 1 is same as Period 2 (first numbered item in paragraph) contradicts the empirical observation summarized at the top of page 107 that Period 2 is typically longer than Period 1. Revise the text to reconcile this discrepancy.	Agree	See response to Comment ID No. 336.	The response is acceptable.
352	Appendix G FMRM	Section 5.3.5	109	G.S.53	Page 109, Section 5.3.5 Specification of Propwash Resuspension Submodel Input Parameters, first bullet item and Table G5-5: There is an inconsistency between the first bullet item on page 109 and the first record in Table G5-5. The latter indicates the quantity Ws,1C-fast/Ws,1C-slow as being in percentage units. This is inconsistent with the former, which is expressed as a unitless quantity. Revise as appropriate.	Agree	The table will be revised as requested.	The response is acceptable.
353	Appendix G FMRM	Section 5.3.5	110	G.S.54	Page 110, Section 5.3.5 Specification of Propwash Resuspension Submodel Input Parameters, paragraph following equation G-26: The text indicates 476 propwash events but only 34 events with evidence of resuspension following the conceptual picture shown in Figure G5-66. Revise the text to clarify model performance; if the model were applied to the period of the Phase 2 propwash monitoring program, would it calculate 476 propwash events and 476 resuspension events? Clarify if the propwash resuspension model is intended to reproduce individual propwash resuspension events in detail or the net integrated long-term morphological impacts of navigation in the Study Area.	Agree	The text will be revised to clarify that the propwash model is intended to reproduce the net integrated long-term morphological impacts of navigation in the Study Area.	The response is partially acceptable. Revise the text to also address the first question in the comment - if the model were applied to the period of the Phase 2 propwash monitoring program, would it calculate 476 propwash events and 476 resuspension events?
354	Appendix G FMRM	Section 5.3.5	110	G.S.55	Page 110, Section 5.3.5 Specification of Propwash Resuspension Submodel Input Parameters: Revise the text to mention the treatment of sands (mainly with respect to settling characteristics) resuspended by propwash.	Agree	The text will be revised as requested.	The response is acceptable.
355	Appendix G FMRM	Section 5.3.6	111	G.S.56	Page 111, Section 5.3.6 Revised Sediment Bed Model for Propwash Resuspension and Figure G5-70: The text in this section and figure refers to a one-layer bed model. Revise the text and figure to indicate if the revised bed layer model preserves the multilayer formulation described in Section 5.4.2 (developed using Sedflume-measured erosion properties). Also indicate if/how this revised one-layer bed layer formulation is integrated with the active-buffer-parent layer formulation used for erosion under hydrodynamic forcings in Newtown Creek.	Agree	The text will be revised as requested.	The response is acceptable.
356	Appendix G FMRM	Section 5.3.7	111	G.S.57	Page 111, Section 5.3.7 Diagnostic Simulations with Propwash Resuspension Incorporated into Sediment Transport Model: Since the diagnostic simulations described by the section heading are not presented in the 2019 FMRM, there does not seem to be a specific reason to include this section. Delete the section.	Agree	This section will be deleted.	The response is acceptable.
357	Appendix G FMRM	Section 5.4.1	114	G.S.58	Page 114, Section 5.4.1 Sediment Size Class Characteristics, last paragraph, third sentence: Revise the text to clarify how Class 3 particles informed the Phase 2 field study.	Agree	The text will be revised as requested.	The response is acceptable.

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358	Appendix G FMRM	Section 5.4.2	114	G.S.59	Page 114, Section 5.4.2 Bed Properties, first paragraph, third sentence: Provide the rationale and supporting analyses for the hard-bottom assumption for the first row of grid cells at the mouth of Newtown Creek. This is inconsistent with the measured bathymetric change shown in the upper panel of Figure G5-144, which shows patterns of erosion and deposition in this area. This assumption limits the applicability of the model for this section of the Study Area. Specifically, address why it was necessary to assume a hard bottom for this row of cells and why it was only applied to one row of cells and not two or three. It is also stated in the last sentence that a zero settling velocity was used for all suspended sediment in the portion of the grid where the bottom was assumed to be hard. EPA had previously recommended that a model simulation be performed in which a non-zero settling velocity was used for this suspended sediment to allow for a determination of the impact of this unrealistic assumption. The results of this simulation should be presented in this section.	Agree	The hard-bottom assumption was assumed for all cells that extended into the East River. Diagnostic simulations were conducted to evaluate the effect of the hard-bottom assumption. These topics will be clarified in the text.	The response is acceptable.
359	Appendix G FMRM	Section 5.4.2	114	G.S.60	Page 114, Section 5.4.2 Bed Properties: Revise the text to clarify if the hard-bottom assumption allows for settling in the water column.	Agree	The text will be revised as requested.	The response is acceptable.
360	Appendix G FMRM	Section 5.4.2	115	G.S.61	Page 115, Section 5.4.2 Bed Properties: Define “A” (and “n”) in equation G-27. It was not defined in Attachment G-J either. “A” (and “n”) should be defined explicitly as site-specific constants on page 115 along with the definitions of the other terms in equation G-27.	Agree	The text will be revised as requested.	The response is acceptable.
361	Appendix G FMRM	Section 5.4.3.1.1	118	G.S.62	Page 118, Section 5.4.3.1.1 East River-Newtown Creek Grain Size Distribution Data Collection and Analysis, first paragraph: Revise the text to include a summary of the analytical protocols—TSS measurements, deflocculation, wet sieving for various size fractions, etc. This will help with interpretation of subsequent text describing how the data were used to support the development of model inputs.	Agree	The text will be revised as requested.	The response is acceptable.
362	Appendix G FMRM	Section 5.4.3.1.1	119	G.S.63	Page 119, Section 5.4.3.1.1 East River-Newtown Creek Grain-Size Distribution Data Collection and Analysis, first incomplete paragraph, second-to-last sentence: Revise the text to indicate that the water column samples were analyzed for TSS and solids concentrations corresponding to different size ranges (by sieving). The GSD was a result of the analytical measurements, not the analyte as currently indicated by the text.	Agree	The text will be revised as requested.	The response is acceptable.

ID No.	Section Name/Topic	Section/Table/ Figure No.	Page No.	Reviewer Comment No.	Comment Text	Category	Response/Proposed Path Forward	EPA Comment (12/16/2019)
363	Appendix G FMRM	Section 5.4.3.1.1	119	G.S.64	Page 119, Section 5.4.3.1.1 East River-Newtown Creek Grain-Size Distribution Data Collection and Analysis, first complete paragraph and Figure G5-80: The raw data from the sampling study consists of TSS, and solids concentrations corresponding to the coarse (>62 µm) and fine (<62 µm) fractions. Present in Figure G5-80 the (1) measured TSS concentrations, (2) measured concentrations of the coarse fraction, (3) measured concentrations of the fine fraction, (4) TSS calculated as the sum of concentrations corresponding to the coarse and fine fractions, and (5) comparison of measured TSS and TSS calculated as the sum of concentrations corresponding to the coarse and fine fractions. Revise the text to also include a discussion of the fact that the TSS calculated as the sum of concentrations corresponding to the coarse and fine fractions typically exceeded the measured TSS for a given sample.	Disagree	In the October 17, 2018 presentation *Water Column Grain Size Distribution Data EPA Comments on NCG Analysis and EPA Analysis/Proposal for Use in Model*, the USEPA stated that the GSD data are likely affected by an unknown source of error that is confined to the coarse fraction. The USEPA also proposed only using the fine fraction of the GSD data and only using it for estimating a washload content at the East River open boundary and estimating a low-end settling velocity for fine sediment. This proposed approach is consistent with the approach used in the 2019 FMRM for specifying the East River open boundaries and consistent with the verbal concurrence reached at the in-person meeting with USEPA on October 25, 2018, about the use of the surface water GSD data. Because the data have an unknown source of error, the NCG does not think it is necessary to add additional analysis and discussion of data that were not used. Attachment G-N documents the GSD study and the data. Text in the FMRM will be revised to reference Attachment G-N in Section 5.4.3, and Attachment G-N will be revised to more fully clarify any issues or uncertainties in the GSD data. Text in the FMRM will be revised to remove any unsupported inferences about the GSD data that are not relevant to how the data were used to inform the modeling. The USEPA verbally agreed with this approach during the phone discussion with the NCG on October 18, 2019.	The response is acceptable. As mentioned by EPA during the phone discussion with the NCG on October 18, 2019, Section 5.4.3.1.1 of the 2019 draft FMRM includes discussion and presentation of the coarse fraction data, and unsupported conclusions on the nature of the coarse fraction data. The text also does not describe how the fine fraction data were used to develop relevant model inputs. As described by the NCG in the response to comments, the data were instead processed and assessed in a manner consistent with EPA's proposal of October 17, 2018 rather than as would be inferred from the text in Section 5.4.3.1.1. Revision of the text in Section 5.4.3 as described in the NCG's response will address EPA's comments.
364	Appendix G FMRM	Section 5.4.3.1.1	119	G.S.65	Page 119, Section 5.4.3.1.1 East River-Newtown Creek Grain-Size Distribution Data Collection and Analysis, first complete paragraph and Figures G5-81 to G5-82: In addition to the GSD shown in Figures G5-81 to G5-82, present and discuss the raw data from the sampling study, which includes concentrations for the various size ranges included in Figures G5-81 to G5-82.	Disagree	See response to Comment ID No. 363.	The response is acceptable. Since as described in the NCG's response to comment ID no. 363, the analysis used to define model inputs was somewhat different than that inferred from Section 5.4.3.1.1, the text revision proposed in the context of comment ID no. 363 will address this EPA comment.

ID No.	Section Name/Topic	Section/Table/ Figure No.	Page No.	Reviewer Comment No.	Comment Text	Category	Response/Proposed Path Forward	EPA Comment (12/16/2019)
365	Appendix G FMRM	Section 5.4.3.1.1	119	G.S.66	Page 119, Section 5.4.3.1.1 East River-Newtown Creek Grain-Size Distribution Data Collection and Analysis, first complete paragraph, first numbered item in fourth sentence and Figures G5-83: The referenced figure and text only consider TSS calculated as the sum of the concentrations corresponding to the coarse and fine fractions. Present a similar figure using the measured TSS and discuss in the text.	Disagree	See response to Comment ID No. 363.	The response is acceptable. Since as described in the NCG's response to comment ID no. 363, the analysis used to define model inputs was somewhat different than that inferred from Section 5.4.3.1.1, the text revision proposed in the context of Comment #363 will address this EPA comment.
366	Appendix G FMRM	Section 5.4.3.1.1	119	G.S.67	Page 119, Section 5.4.3.1.1 East River-Newtown Creek Grain-Size Distribution Data Collection and Analysis, second complete paragraph: "The coarse solids content was greater than fine solids content at all sampling locations. Relatively minor spatial variations in coarse solids content (approximately 60% to 70%) were observed in East River and up to approximately CM 1 in Newtown Creek." The report lacks a clear definition of "coarse solids." What is the composition of coarse solids (e.g. fractions of sand, silt, clay and organic matter)? What class does it fall into? Expand the text to define coarse solids, including composition and classification.	Agree	The text will be expanded to define the classification of coarse and fine solids; however, the composition of the coarse solids will not be described because the source of error with the coarse fraction is unknown. See response to Comment ID No. 363.	The response is acceptable.
367	Appendix G FMRM	Section 5.4.3.1.1	120	G.S.68	Page 120, Section 5.4.3.1.1 East River-Newtown Creek Grain-Size Distribution Data Collection and Analysis, bullet items at end of section: "The GSD data cannot be used to estimate the inorganic sand content at the East River boundaries of the sediment transport model." Explain why. GSD data were supposed to be used to determine East River boundary conditions. How does the limitation in the GSD data affect the sediment transport framework, model runs, and results?	Disagree	See response to Comment ID No. 363.	The response is acceptable.
368	Appendix G FMRM	Section 5.4.3.1.1	120	G.S.69	Page 120, Section 5.4.3.1.1 East River-Newtown Creek Grain-Size Distribution Data Collection and Analysis, bullet items at end of section: Revise the text to include a summary of the bias between the measured TSS and TSS calculated from the concentrations of various coarse and fine fractions.	Disagree	See response to Comment ID No. 363.	The response is acceptable. Since as described in the NCG's response to comment ID no. 363, the analysis used to define model inputs was somewhat different than that inferred from Section 5.4.3.1.1, the text revision proposed in the context of Comment #363 will address this EPA comment.

ID No.	Section Name/Topic	Section/Table/ Figure No.	Page No.	Reviewer Comment No.	Comment Text	Category	Response/Proposed Path Forward	EPA Comment (12/16/2019)
369	Appendix G FMRM	Section 5.4.3.1.1	120	G.S.70	Page 120, Section 5.4.3.1.1 East River-Newtown Creek Grain-Size Distribution Data Collection and Analysis, bullet items at end of section: Provide direct empirical lines of evidence such as POC, chlorophyll-a, and other relevant data to support the assertion that: "(1) Coarse solids must be organic solids," and "(2) data suggest that an organic bloom was in progress."	Disagree	The references to POC and organic matter in the FMRM will be removed from the text because the GSD data did not allow for the determination of the composition of the coarse size fraction. See response to Comment ID No. 363.	The response is acceptable. Since as described in the NCG's response to comment ID no. 363, the analysis used to define model inputs was somewhat different than that inferred from Section 5.4.3.1.1, the text revision proposed in the context of comment ID no. 363 will address this EPA comment.
370	Appendix G FMRM	Section 5.4.3.1.2	120	G.S.71	Page 120, Section 5.4.3.1.2 Use of Surface Water Data Collected on June 18, 2018 to Guide Specification of Sediment Transport Model Inputs, third bullet: Revise the text to describe how the initial estimate for the washload fraction was established as 20 to 30%.	Agree	The text will be revised as requested.	The response is acceptable.
371	Appendix G FMRM	Section 5.4.3.2	123	G.S.72	Page 123, Section 5.4.3.2 Point Source Discharges, last paragraph: Revise the text to provide the rationale/analyses supporting the lack of any washload input from the point sources.	Agree	The text will be revised as requested.	The response is acceptable.
372	Appendix G FMRM	Section 5.5.1	126	G.S.73	Page 126, Section 5.5.1 Calibration and Validation Process, first paragraph and Figure G5-107: Revise either the figure or the text to be consistent with each other. The figure currently says all metrics were used for calibration, whereas the text says only NSRs were used for calibration, but bed composition and TSS were used for validation.	Agree	The figure will be revised as requested.	The response is acceptable.
373	Appendix G FMRM	Section 5.5.1.1	127	G.S.74	Page 127, Section 5.5.1.1 Stage 1: Model Calibration without Propwash Resuspension, second bullet: Revise the text to reconcile the calibrated washload content of 37% with the empirical estimate of 20 to 30% mentioned in Section 5.4.3.1.2.	Agree	The text will be revised as requested.	The response is acceptable.
374	Appendix G FMRM	Section 5.5.1.1	127	G.S.75	Page 127, Section 5.5.1.1 Stage 1: Model Calibration without Propwash Resuspension, last paragraph: The settling velocities for classes 1A and 1B (listed as 1 and 3 meters per day [m/d], respectively) and the fractions of class 1B-settleable and class 1B-washload (listed as 61 and 37%, respectively) appears to be inconsistent with values in the model input files. Based on the model input files, settling velocities for classes 1A and 1B are 3 and 2 m/d, respectively, and the fractions of class 1B-settleable and class 1B-washload are 68.6 and 29.4%, respectively. Review and revise the text as appropriate.	Agree	The text will be revised as requested.	The response is acceptable.

ID No.	Section Name/Topic	Section/Table/ Figure No.	Page No.	Reviewer Comment No.	Comment Text	Category	Response/Proposed Path Forward	EPA Comment (12/16/2019)
375	Appendix G FMRM	Section 5.5.1.2	127	G.S.76	Page 127, Section 5.5.1.2 Stage 2: Model Calibration with Propwash Resuspension: It is unclear how the calibration parameters (mean and standard deviation of applied power distribution) developed for the spreadsheet-based empirical propwash submodel described in Section 5.3.4 were applied to the propwash submodel in the fate and transport model. Instead, the fate and transport model calibration described in Section 5.5.1.2 introduces two new calibration parameters for the propwash submodel—the maximum relative applied hp and the minimum distance between the propeller tip and the bed. Revise the text to make the connection between the propwash model calibration established in Section 5.3.4 and the application of the propwash submodel in the fate and transport model. Also address the impact of the two additional calibration parameters described in Section 5.5.1.2 on the propwash submodel calibration performance described in Section 5.3.4. In other words, explain how the propwash submodel calibration performance described in Section 5.3.4 is impacted by the two additional calibration parameters described in Section 5.5.1.2.	Agree	The text will be revised as requested.	The response is acceptable.
376	Appendix G FMRM	Section 5.5.1.2	127	G.S.77	Page 127, Section 5.5.1.2 Stage 2: Model Calibration with Propwash Resuspension: This section needs to be expanded to describe the calibration procedure in more detail. For example, define “optimum model performance.” Why were the parameters given in the first set of three bullets chosen for adjustment during calibration the only parameters that were adjusted? Why was the sediment resuspended by propwash distributed only over the lower half of the water column? In contrast, anecdotal observations in Newtown Creek of propwash resuspension induced by a sampling vessel indicate sediment plumes at the water surface. Details of these calibration efforts and appropriate sensitivity analyses must be included in the FMRM or as an attachment to the FMRM.	Agree	The analysis of the ADV data related to propwash resuspension was done to limit the number of adjustable parameters in the propwash model. Because of this data-based reduction in the adjustable parameters, only a subset of the parameters in the propwash model could be adjusted during model calibration. The text will be revised as requested to clarify why only a subset of the parameters were adjusted and describe any relevant diagnostics related to those parameters.	The response is acceptable.
377	Appendix G FMRM	Section 5.5.1.2	127	G.S.78	Page 127, Section 5.5.1.2 Stage 2: Model Calibration with Propwash Resuspension, last paragraph, including three bullet items: Revise the text to indicate the impact of the constraints listed in the first two bullets on the performance of the calibrated empirical propwash model described in Section 5.3.4.	Agree	The text will be revised as requested.	The response is acceptable.
378	Appendix G FMRM	Section 5.5.2.1	129	G.S.79	Page 129, Section 5.5.2.1 Model Calibration without Propwash Resuspension: NSRs for 1999 to 2012, first complete paragraph, last sentence: Revise the text to describe how the three listed factors affect the predicted NSRs and the potential artifacts that may have been introduced in the model due to simplifying assumptions, especially for the second and third listed factors.	Agree	The text will be revised as requested.	The response is acceptable.

ID No.	Section Name/Topic	Section/Table/ Figure No.	Page No.	Reviewer Comment No.	Comment Text	Category	Response/Proposed Path Forward	EPA Comment (12/16/2019)
379	Appendix G FMRM	Section 5.5.2.3	130	G.S.80	Page 130, Section 5.5.2.3 Model Validation Without Propwash Resuspension: TSS Concentration for 2012 to 2015, and Attachment G-L Sediment Transport Model Calibration and Validation Results (Figures G-L-1 through G-L-28): The sediment transport model underpredicts measured TSS concentrations. The underprediction may not be improved with additional sediment transport model calibration effort. Accordingly, CF&T modeling of particulate phase chemicals in the Newtown Creek water column will require the development of a method to account for or offset the sediment transport model underprediction of TSS. The draft RI must indicate that this need will be addressed during CF&T modeling. Overall, model prediction (without the propwash resuspension submodel) of TSS data in Newtown Creek was fair to poor (e.g., Figures G5-120, G-L-6, G-L-11, and others). Three figures (G5-133 through G5-135) were provided showing the effect of the propwash resuspension submodel on model-data agreement for TSS, with the overall conclusion that activating propwash resuspension does not notably alter model response for predicting TSS. Therefore, comments below focus on model-data TSS comparisons without inclusion of the propwash resuspension submodel, with the expectation that the comments would remain valid if the propwash resuspension submodel were activated.	Agree	Per the response to Comment ID No. 281, the sediment transport model will be revised to include a sediment class that has a settling velocity representative of flocculated sediment for the East River open boundaries and is recalibrated. As part of this process, the NCG will endeavor to improve the model-predicted TSS during recalibration of the sediment transport model. The text will be revised based on the revised model calibration, as well as additional diagnostic simulations conducted and the comments on the FMRM. The CFT modeling effort will examine the effects of any remaining bias in the predicted TSS from the recalibrated sediment transport model on the CFT model predictions.	The response is acceptable.
380	Appendix G FMRM	Section 5.5.2.3	130	G.S.80a	During dry-weather intervals (Figures G5-120 and G5-121 and Figures G-L-1 through G-L-19), modeled TSS upstream of CM 2 frequently underpredicted TSS data by a factor of 2 or 3 (roughly equivalent to 10 to 20 mg/L), which will have important consequences for fate and transport modeling of chemicals that sorb strongly to solids. Provide discussion of this result and how it will be addressed for chemical fate and transport modeling.	Agree	See response to Comment ID No. 379.	The response is acceptable.
381	Appendix G FMRM	Section 5.5.2.3	130	G.S.80b	Indicate that for dry-weather intervals in which model and data agreed reasonably well (e.g., Figures G5-121 G-L-4, and G-L-17) the agreement was due to a creek-wide reduction in magnitude of the TSS data and not due to a fundamental change in the model response. Good model-data agreement only occurred when the magnitude of the TSS data dropped to the consistently low response level of the model.	Agree	See response to Comment ID No. 379.	The response is acceptable.
382	Appendix G FMRM	Section 5.5.2.3	130	G.S.80c	Indicate that during wet-weather intervals (Figures G5-122 and G5-123 and Figures G-L-20 through G-L-28), the model-predicted the 10th to 90th percentile range was wider (i.e., in response to point source discharge of solids); however, despite the increased range in model TSS concentrations, the overall model-data agreement remained fair to poor, with important consequences for fate and transport modeling of particulate phase chemicals.	Agree	See response to Comment ID No. 379.	The response is acceptable.

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383	Appendix G FMRM	Section 5.5.2.3	130	G.S.80d	Interpreting model-data agreement for dry- and wet-weather intervals was confounded by the manner in which the plot intervals were parsed. Interpretation of model-data agreement is confounded by the varying durations of the plot interval. Plot intervals coincided with the durations of various field surveys (see Table G5-16), with surveys varying in duration from 1 to 23 days. Thus, the number of data points in a plot and the variability of those data increased with the duration of the plotting interval. Similarly, the time-averaged model response (mean, 10th percentile, and 90th percentile) also varied over different averaging durations. Provide a description of the effect of varying durations on the comparability of results.	Disagree	Wet and dry periods were specified for the corresponding data collection episodes, so the variability in the model was calculated over the interval of data collection. This resulted in different numbers of data points and different ranges in the predicted 10th and 90th percentiles, depending on each individual model-data comparison. However, the specification of a period as wet or dry and the use of the model predictions over the course of the data collection is appropriate, so that the model-data comparison is made over the same duration as which the data were collected. The text will be revised to clarify the specifications of wet and dry periods for both the hydrodynamic model and the sediment transport model. The text will also be revised to discuss the impact of designating a period as wet or dry on interpretations of the model predictions. The methods used to designate wet and dry periods, however, will not be modified.	The response is acceptable.
384	Appendix G FMRM	Section 5.5.2.3	130	G.S.80e	The plot-interval parsing method resulted in other oddities. For example, Figure G-L-2 presents a 1-day, dry-weather plot for March 20, 2012. Figure G5-120 presents a 7-day, dry-weather plot for March 19 to 25, 2012. Rightfully, one would expect that the TSS data plotted for March 20 (Figure G- L-2) would be included in the plot for March 19 to 25 (Figure G5-120), but it is not. Including the March 20 data in the plot for March 19 to 25 would have given a very different impression of model-data agreement for the dry-weather interval of March 19 to 25. Include the March 20, 2012 data on the diagram for March 19 to 25 or provide a statement explaining the omission.	Agree	The figure will be revised as requested.	The response is acceptable.
385	Appendix G FMRM	Section 5.5.2.3	130	G.S.80f	Designations of dry- and wet-weather intervals also varied by duration of the field surveys rather than by the actual lengths of dry- and wet-weather intervals. Dry-weather conditions were defined when predicted point source discharge was less than 3 MGD when averaged over the duration of the field survey. As a result, overlapping field surveys (and their corresponding model-data comparison plots) can have opposite dry- and wet-weather designations. For example, Figure G-L-10 presents a model-data comparison for the 3-day, dry-weather interval of August 21 to 23, 2012. That interval falls within the 19-day, wet-weather interval of August 13 to 31, 2012, plotted in Figure G-L-22. Thus, it is not clear whether dry- and wet-weather TSS data and the corresponding model responses are parsed and presented in a logical and obvious manner. Address the ambiguities of dry- and wet-period designations.	Disagree	See response to Comment ID No. 383.	The response is acceptable.

ID No.	Section Name/Topic	Section/Table/ Figure No.	Page No.	Reviewer Comment No.	Comment Text	Category	Response/Proposed Path Forward	EPA Comment (12/16/2019)
386	Appendix G FMRM	Section 5.5.2.3	131	G.S.81	81. Page 131, Section 5.5.2.3 Model Validation Without Propwash Resuspension: TSS Concentration for 2012 and 2015, bullet list: The report states that there were three primary causes of poor model-data agreement for TSS: • Specification of temporally constant TSS concentration in the East River • Specification of temporally constant TSS concentration for point source discharges • Neglect of internal production of solids via algal production There are a number of other causes that are potentially as likely that the RI should also identify: • Specification of GSDs at model boundaries and point sources • Specification of solids settling speeds • Specification of bed roughness affecting the magnitude of bed shear stress • Specification of the critical skin-friction shear stress for deposition • Uncertainty in the TSS data, which shows relatively high variability both temporally and spatially	Agree/Disagree	The text will be revised as suggested to note that the specification of input GSDs, solids settling speeds, and uncertainty in TSS data may also potentially contribute to the poor model-data agreement for TSS. However, previous diagnostic simulations have indicated that specification of bed roughness and critical skin-friction values have a negligible effect on predicted TSS in Newtown Creek, so these factors will not be added to the text.	The response is acceptable.
387	Appendix G FMRM	Section 5.5.2.3	131	G.S.82	Page 131, Section 5.5.2.3 Model Validation Without Propwash Resuspension: TSS Concentration for 2012 and 2015, last sentence: This sentence overstates the ability of the sediment transport model (without propwash resuspension) to "reproduce the data-based spatial gradient in fine SSC." The model results show a decreasing trend in fine SSC from mouth to head, which is a natural consequence of the model kinetics for dry-weather conditions. The SSC data also show a decreasing trend from mouth to head; however, the slope of the averaged model-predicted values (blue line) does not match the slope of the data values. Moreover, the model's upper 90th percentile values underpredict the SSC data for 8 of 10 cases. The RI needs to acknowledge the underprediction.	Agree	See response to Comment ID No. 379.	The response is acceptable.
388	Appendix G FMRM	Section 5.5.3.1	132	G.S.83a	Page 132, Section 5.5.3.1 Model Calibration with Propwash Resuspension: NSRs for 1999 to 2012: Model-predicted NSRs with the propwash resuspension submodel differ minimally from NSRs without the submodel. To the extent that the EPA calibration ranges (Figure G5-125) reflect reach-scale NSR uncertainty, the differences with and without the propwash resuspension submodel fall well within that uncertainty. Given the number of assumptions and controlling variables inherent in the propwash resuspension submodel, one must conclude that potential calibration of the submodel is not well constrained by the EPA Calibration Ranges. The RI needs to indicate the limitations of NSRs as a constraint on the propwash resuspension submodel.	Agree	The text will be revised as requested.	The response is acceptable.

ID No.	Section Name/Topic	Section/Table/ Figure No.	Page No.	Reviewer Comment No.	Comment Text	Category	Response/Proposed Path Forward	EPA Comment (12/16/2019)
389	Appendix G FMRM	Section 5.5.3.1	132	G.S.83b	Comparisons of model NSR predictions with propwash resuspension at additional reach scales (Figures G5-126 to G5-129) to similar predictions without propwash resuspension show a propwash-induced reduction in NSRs primarily near the creek mouth (i.e., CM 0–0.5 and CM 0.5–1) and little effect elsewhere. The propwash-induced NSR reductions near the mouth appear excessive. The model-predicted NSRs now fall notably below the error bars of the data-based NSR estimates, whereas previously without the propwash resuspension submodel, the model NSR predictions fell within the data-based error bars. Farther from the mouth, effects of the propwash resuspension submodel are negligible at the various reach scales presented, leaving the calibration of the submodel not well constrained by these data. The RI needs to indicate the limitations of NSRs as a constraint on the propwash resuspension submodel.	Agree	The NCG expects that these figures will change as a result of the revisions to the sediment transport and propwash models (per the responses to Comment ID Nos. 281 and 277). Based on the updated propwash model results, the text will be revised as appropriate to indicate the limitations of NSRs as a constraint on the propwash resuspension submodel.	The response is acceptable.
390	Appendix G FMRM	Section 5.5.3.2	133	G.S.84a	84. Page 133, Section 5.5.3.2 Model Validation with Propwash Resuspension: Bed Properties for 1999 to 2012: Comparisons of plotted model results with and without propwash resuspension are inconsistent with the statements made in this subsection: Comparison of Figure G5-130 to Figure G5-117 shows very slight increases in model-predicted fines content for CM 0–2 and CM 2+ with propwash resuspension. The subsection text reports the opposite. Revise per the comment.	Agree	The text will be revised as requested.	The response is acceptable.
391	Appendix G FMRM	Section 5.5.3.2	133	G.S.84b	State that comparison of Figure G5-131 to Figure G5-118 shows very slight increases in model-predicted fines content for CM 0–1 and CM 2+ with propwash resuspension. CM 1–2 shows a barely discernible increase in fines content with propwash resuspension.	Agree	The text will be revised as requested.	The response is acceptable.
392	Appendix G FMRM	Section 5.5.3.2	133	G.S.84c	State that comparison of Figure G5-132 to Figure G5-119 shows a slight increase in model-predicted fines content for CM 0–0.5 with propwash resuspension and a slight decrease for CM 1.5–2. Differences with and without propwash resuspension are indiscernible for CM 0.5–1 and CM 1–1.5.	Agree	The text will be revised as requested.	The response is acceptable.
393	Appendix G FMRM	Section 5.5.3.2	133	G.S.84d	Indicate that for all cases the differences in fines content with and without propwash resuspension are minimal and are much smaller than data uncertainty as represented by the wide error bars for the data-based estimates. Thus, it is impossible to ascertain whether including the propwash resuspension submodel represents an improvement to the sediment transport model. Validation of the propwash resuspension submodel is not well constrained by these data.	Agree	See response to Comment ID No. 280.	The response is acceptable.
394	Appendix G FMRM	Section 5.5.3.3	134	G.S.85	Page 134, Section 5.5.3.3 Model Validation with Propwash Resuspension: TSS Concentration for 2012 to 2015: Differences in model-data TSS comparisons with and without propwash resuspension are barely discernible. Propwash resuspension is infrequent and effects are of short duration; therefore, the likelihood that such an event would coincide with field measurement of TSS is low. Hence, the data do not provide a suitable constraint for validation of the propwash resuspension submodel. Indicate this limitation in the RI. The most discernible differences with propwash resuspension are observed as abrupt increases in model-predicted TSS at approximately CM 3.75 (upper English Kills) in Figures G5-134 and G5-136. This location is approximately one-quarter mile beyond the maximum upstream extent of ship traffic, and the abrupt spikes in model-predicted TSS suggest a modeling artifact or instability of the sediment-transport model when coupled with the propwash resuspension submodel. Include text explaining the model behavior at this location.	Agree	See response to Comment ID No. 280.	The response is acceptable.

ID No.	Section Name/Topic	Section/Table/ Figure No.	Page No.	Reviewer Comment No.	Comment Text	Category	Response/Proposed Path Forward	EPA Comment (12/16/2019)
395	Appendix G FMRM	Section 5.5.3.4	134-137	G.S.86a	Pages 134-137, Section 5.5.3.4 Model Validation with and without Propwash Resuspension: Evaluation of Predicted Net Sedimentation Rates at Different Spatial Scales: The description of Figure G5-137 omits an important observation. While the curve of model-predicted NSRs with the propwash resuspension is more variable than without, the trend is frequently in the opposite direction of the data-based NSRs. That is, when data-based NSRs are notably higher than predicted by the sediment transport model without the propwash resuspension submodel, the model-predicted NSRs with the propwash resuspension submodel are even lower (i.e., worse). So while the model-predicted NSRs curve without propwash resuspension shows less small-scale variability, that curve on average is in better agreement with the data-based NSRs than is the model with propwash resuspension. Correct the omission and add the observation.	Agree	The text will be revised as appropriate, based on the updates and revisions to the propwash model and sediment transport model calibration, per the responses to Comment ID Nos. 277 and 281.	The response is acceptable.
396	Appendix G FMRM	Section 5.5.3.4	134-137	G.S.86b	The extremely complex propwash resuspension submodel purports to predict propwash effects mechanistically on the spatial scale of a model grid cell; however, the cumulative distribution plots (Figures G5-138 through G5-143) are not pair-wise model-data comparisons of NSRs for each grid cell. Present pair-wise model-data comparisons of NSRs for each grid cell (e.g., Taylor diagrams). Is the mechanistic propwash resuspension submodel any more accurate on a grid-cell basis than an appropriately scaled random erosion function applied within the navigation channel?	Disagree	Comparing the model to the data on a paired grid cell basis is not appropriate, because the model was not designed to be used on an individual grid-cell basis. Some of the locations of data-based erosion occur in areas likely to be subject to ship maneuvering, which is not represented by the model; thus, the sediment transport model with propwash cannot be expected to predict erosion exactly in these areas. In addition, the propwash model uses a single year of ship-traffic data across all years and, therefore, does not represent the actual historical ship traffic over the 14-year calibration period on a grid-cell-by-grid-cell basis. In addition, Comment ID No. 397 cautions against doing model-data comparisons on an individual grid-cell basis.	The response is partially acceptable. The NCG should include the sources of uncertainty referenced in the response as well as in Section 5.3.4 (lack of vessel maneuvering, use of vessel traffic from a single year, vessel location, applied power, actual draft, etc.) in the text in Section 5.5.3.4.

ID No.	Section Name/Topic	Section/Table/ Figure No.	Page No.	Reviewer Comment No.	Comment Text	Category	Response/Proposed Path Forward	EPA Comment (12/16/2019)
397	Appendix G FMRM	Section 5.5.3.4	134-137	G.S.86c	The model-predicted cumulative distribution curves for NSRs with and without propwash resuspension are not notably different for cumulative frequency greater than 50%. The primary difference is that the propwash resuspension submodel can result in net negative (i.e., erosive) NSRs, although not necessarily in the correct locations (see previous comment regarding Figure G5-137). However, the issue of net negative NSRs, itself, deserves some consideration. Ships have been trafficking Newtown Creek for several decades. Does it make sense that large areas of the navigation channel remain net erosive at rates of 4 or more centimeters per year (cm/yr) (e.g., Figures G5-144 and G5-145) over the decadal times scales being modeled (i.e., 1999 to 2012)? How much deeper must the navigation channel become before it achieves quasi-equilibrium? One of the principal reasons that data-based NSRs have been evaluated for the project primarily on a reach-scale basis is a general recognition that data-based NSRs assessed on much smaller scales (e.g., model grid scale) introduce unacceptably high uncertainty. Thus, it is a concern that the propwash resuspension submodel may be attempting to reproduce what amounts to small-scale uncertainty (i.e., noise) in the data-based NSRs. Note that this is not a statement that propwash has no impact. The bathymetry data provide clear evidence that propwash scour has deepened the channel in areas of transit and maneuver. Rather, the point is that after several decades of ship traffic, one might expect that the navigation channel has achieved quasi-equilibrium between solids deposition and propwash scour on annualized or longer time scales and that net-negative data-based NSRs on small spatial scales may be dominated by data uncertainty. Incorporate text to address these issues.	Agree	This text will be revised following any modifications to the propwash and sediment transport models.	The response is acceptable.
398	Appendix G FMRM	Section 5.5.3.5	137	G.S.87	Page 137, Section 5.5.3.5 Comparison of Sediment Transport Model Predictions of NSRs with and without Propwash Resuspension, and Figures G5-144 and G5-145: Clarify the source for the data-based NSRs presented in the upper panels of the referenced figures. Is it 1991 to 2012 or 1991 to 2012 in the main stem and 1999 to 2012 in English Kills? Also comment on the lack of data-based NSRs in the other tributaries.	Agree	The text will be revised as requested.	The response is acceptable.

ID No.	Section Name/Topic	Section/Table/ Figure No.	Page No.	Reviewer Comment No.	Comment Text	Category	Response/Proposed Path Forward	EPA Comment (12/16/2019)
399	Appendix G FMRM	Section 5.5.3.5	137	G.S.88	Page 137, Section 5.5.3.5 Comparison of Sediment Transport Model Predictions of NSRs with and without Propwash Resuspension, and Figure G5-145: Review of Figure G5-145 does not show a good spatial correspondence between the measured and model-calculated NSRs. Some prominent examples include: a. The model does not reproduce the erosional pattern at the mouth of the creek. Instead, the model calculates deposition of approximately 8 feet in the navigation channel (NSR of approximately 15 cm/year). This magnitude of NSR is inconsistent with the measured NSR seen in Figure G5-137. This magnitude of deposition is also inconsistent with the measured bathymetric change over the 1999–2012 period. This is also an unrealistic result since such a magnitude of deposition would represent a navigation hazard preventing the entry of vessels into Newtown Creek. b. Instead of the measured depositional signal both inside and outside the navigation channel between CM 0.1–0.5, the model calculates relatively little deposition outside the navigation channel and erosion inside the navigation channel. c. The model does not reproduce the measured erosional signal within the Turning Basin. d. The model does not reproduce the measured erosional signal within English Kills. Revise the text to include a discussion of these differences between model and data, potential explanations for these differences, and anticipated impacts on the performance of the CF&T model.	Agree (subcomments a and b) Disagree (subcomments c and d)	Subcomments a and b: The text will be revised following any modifications to the propwash and sediment transport models. Subcomments c and d: These erosional areas are likely associated with areas of ship maneuvering and turning. Maneuvering is not represented in the propwash model, so the model is not expected to reproduce these erosional areas.	The response is partially acceptable. The NCG should include the sources of uncertainty referenced in the response as well as in Section 5.3.4 (lack of vessel maneuvering, use of vessel traffic from a single year, vessel location, applied power, actual draft, etc.) in the text in Section 5.5.3.5 as potential explanations for the apparent differences between model and data. The NCG should also include a discussion of the impact of the noted discrepancies in propwash model performance on the performance of the CF&T model.
400	Appendix G FMRM	Section 5.5.3.5	138	G.S.89	Page 138, Section 5.5.3.5 Comparison of Sediment Transport Model Predictions of NSRs with and without Propwash Resuspension, first paragraph: Revise the text to describe how the left, middle, and right portions of the creek were defined. Was this based on a spatial overlay with the federal navigation channel?	Agree	The text will be revised as requested.	The response is acceptable.
401	Appendix G FMRM	Section 5.5.3.5	138	G.S.90	Page 138, Section 5.5.3.5 Comparison of Sediment Transport Model Predictions of NSRs with and without Propwash Resuspension: For Figures G5-153 through G5-156: What is the relevance of a ΔNSR14-year based on grid-scale comparison of model predictions with and without propwash resuspension? Provide a discussion.	Agree	The text will be revised as requested.	The response is acceptable.
402	Appendix G FMRM	Section 5.6.1.2	140	G.S.91	Page 140, Section 5.6.1.2 Diagnostic Analysis: Relative Effects of East River and Point Source Sediment Loads and Figures G5-160 and G5-161: East River solids represent nearly 65 to 100% of deposited solids in CM 0–2+, greater than 80% in Dutch Kills and Whale Creek, and up to 50% in portions of East Branch and English Kills. Revise the text to mention this.	Agree	The text will be revised as requested.	The response is acceptable.
403	Appendix G FMRM	Section 5.6.1.2	140	G.S.92	Page 140, Section 5.6.1.2 Diagnostic Analysis: Relative Effects of East River and Point Source Sediment Loads and Figures G5-160 and G5-161: Regarding the influence of East River solids, the word "dominate" is too subjective and should be avoided. One could argue that East River solids dominate deposition from the mouth through the entire Turning Basin (i.e., CM 0–2+) because those solids represent 65 to nearly 100% of deposited solids through that reach. Section 5.6.1.2 should state that the fraction of East River solids in the bed exceeds 80% in both Dutch Kills and Whale Creek. Further, the RI should indicate that in sections of East Branch and English Kills, up to 50% of the depositing solids are from the East River.	Agree	The text will be revised as requested.	The response is acceptable.

ID No.	Section Name/Topic	Section/Table/ Figure No.	Page No.	Reviewer Comment No.	Comment Text	Category	Response/Proposed Path Forward	EPA Comment (12/16/2019)
404	Appendix G FMRM	Section 5.6.3	146	G.S.93	Page 146, Section 5.6.3 Diagnostic Analysis of Direct Geomorphic Feedback: In the last sentence in the first paragraph, the text states: "were evaluated by incorporating direct feedback between the hydrodynamic and sediment transport models." Presumably, "direct feedback between" means the adjustment of the local grid cell water depth and horizontal current speeds based on the change in calculated bottom elevation in the cell. If this is correct, it is incorrect to refer to this as "direct feedback between the hydrodynamic and sediment transport models" because the hydrodynamic and sediment transport models are not dynamically linked. If not that, was it achieved by running hydrodynamics and sediment transport in the same simulation with the bathymetry updated in the model using morphological changes calculated by the sediment transport model every timestep, or was it accomplished by some other numerical scheme? Revise the text to describe how the direct geomorphic feedback was accomplished.	Agree	The text will be revised as requested.	The response is acceptable.
405	Appendix G FMRM	Section 5.7	149	G.S.94	Page 149, Section 5.7 Conclusions, sixth bullet: Deviations between predicted and data-based NSRs for Maspeth Creek and East Branch are attributed solely to uncertainty in the magnitude and composition of point sources, whereas the text on page 129, Section 5.5.2.1, last sentence in first complete paragraph on the page describes additional factors that may explain the deviation. Revise the text to include the additional factors mentioned previously.	Agree	The text will be revised as requested.	The response is acceptable.
406	Appendix G FMRM	Section 5.7	150	G.S.95	Page 150, Section 5.7 Conclusions, last bullet: In the last bullet, change the statement "the primary causes of poor model-data agreement" to "some of the possible causes of poor model-data agreement." The four factors listed are not the only possible causes and were not definitely proven to be "the primary causes" in the FMRM.	Agree	The text will be revised as requested.	The response is acceptable.
407	Appendix G FMRM	Section 5.7	150	G.S.96	Page 150, Section 5.7 Conclusions, last bullet: In addition to the factors listed in the referenced text, an additional factor that may affect model–data comparisons for TSS is the temporally constant assumptions for settling velocities and solids composition at the boundaries (point sources and open boundaries). Revise the text as appropriate.	Agree	The text will be revised as requested.	The response is acceptable.
408	Appendix G FMRM	Section 5.7	150	G.S.97	Page 150, Section 5.7 Conclusions, last sentence in section: At best, the wording of the last sentence on this page should be changed to "Thus, the sediment transport model is deemed to be appropriate for use in developing and calibrating the chemical fate and transport model." Consistent with the statement in the General Comments section, the sediment transport model (including propwash) is subject to significant uncertainties that can impact the chemical fate and transport model.	Agree	The text will be revised as requested.	The response is acceptable.
409	Appendix G FMRM	Section 7.3.2	163	G.S.98	Page 163, Section 7.3.2 Sediment Transport Conceptual Site Model, first paragraph, third sentence: This is the first mention anywhere in the text on the atypical vertical gradients in TSS during wet-weather versus dry-weather periods. Revise the text in Section 5 to elaborate on this feature and add supporting figures.	Agree	The text in Section 5 will be revised to discuss this feature and reference existing figures showing shallow and deep TSS data (Figures G5-26 and G5-27). Additional figures will not be added.	The response is acceptable.
410	Appendix G FMRM	Tables G5-3 and G5-4	--	G.S.99	Tables G5-3 and G5-4: The referenced tables seem to duplicate the same information; both tables summarize the number of propwash events as seen in the identical numbers presented in them. Review and revise in case these were intended to present different information. If not, delete one of these tables and revise any associated text.	Agree	The tables and text will be revised as requested.	The response is acceptable.

ID No.	Section Name/Topic	Section/Table/ Figure No.	Page No.	Reviewer Comment No.	Comment Text	Category	Response/Proposed Path Forward	EPA Comment (12/16/2019)
411	Appendix G FMRM	Table G5-15	--	G.S.100	Table G5-15: For clarity, revise the headings for the third and fourth columns. The third column appears to include values from the 2016 draft FMRM, whereas the fourth column appears to include values from the 2019 draft FMRM. The existing column headings are somewhat confusing in this regard.	Agree	The table will be revised as requested.	The response is acceptable.
412	Appendix G FMRM	Tables G3-3 and G3-4	--	G.S.101	Tables G3-3 and G3-4: These tables should be combined. G3-4 has several issues on its own and should be revised as follows: a. Area column should be to the left of the frequency column. b. The event counting method is suspect. Based on a 12-h interevent time and an event threshold of 0.0-inch, there were 91 storms per year from 2008 to 2012. With a 0.1-inch threshold (the smallest storms do not produce CSO), there were 60 storms. The count of 106 events at NC-083 suggests that overflows include multiple reported events per actual storm and/or a short interevent time specification. Check the event counting method and revise Table G3-4 accordingly. c. CSO reduction at NC-015 from 560 to 330 million gallons (Mgal) is a 41% decrease, not 43% as reported. d. CSO reduction at NC-077 from 560 to 520 Mgal is a 7% decrease, not 5% as reported.	Agree	The tables will be revised as requested.	The response is acceptable.
413	Appendix G FMRM	Figure G3-1	--	G.S.102	Figure G3-1: The text identifies NYCDEP as "Department of Environmental Conservation."	Agree	The figure will be revised as requested.	The response is acceptable.
414	Appendix G FMRM	Figure G4-130	--	G.S.103	Figure G4-130: Indicate that examination of NOAA rainfall data at Central Park and LGA shows that rainfall began 4/1/2012 at 16:30 and ended 4/2/2012 at 02:00. a. The plot panel for EK022 shows a distinct fresher surface layer on 4/4/2012 at 08:53, approximately 2 days and 7 hours after rainfall ended. b. The plot panel for EB010 shows a distinct fresher surface layer on 4/5/2012 at 08:28, more than 3 days and 6 hours after rainfall ended. c. The plot panel for MC008 shows a less-distinct fresher surface layer on 4/6/2012 at 08:16, more than 4 days and 6 hours after rainfall ended.	Agree	The text will be revised to indicate the timing and duration of these events as requested.	The response is acceptable.
415	Appendix G FMRM	Figure G4-131	--	G.S.104	For Figure G4-131: Indicate that examination of NOAA rainfall data at Central Park and LGA shows that rainfall began 4/22/2012 at 10:30 and ended 4/23/2012 at 08:00. a. The plot panel for NC059BC shows a distinct fresher surface layer on 4/24/2012 at 13:46, approximately 1 day and 6 hours after rainfall ended. b. The plot panel for EB008BC shows a distinct fresher surface layer on 4/25/2012 at 13:14, more than 2 days and 5 hours after rainfall ended.	Agree	The text will be revised to indicate the timing and duration of these events as requested.	The response is acceptable.
416	Appendix G FMRM	Figures G5-138 to G5-143	--	G.S.105	Figures G5-138 to G5-143 – Increase the upper bound on the y-axis so that all model results are plotted. A minor subset of cells included in Figures G5-138 and G5-139 has NSRs greater than the highest y-axis value of 10 cm/yr. Also revise Figures G5-140 to G5-143 for consistency.	Agree	The figures will be revised as requested.	The response is acceptable.

ID No.	Section Name/Topic	Section/Table/ Figure No.	Page No.	Reviewer Comment No.	Comment Text	Category	Response/Proposed Path Forward	EPA Comment (12/16/2019)
417	Appendix G FMRM	Figures G5-138 to G5-143	--	G.S.106	Figures G5-138 to G5-143: Judging by the difference in horizontal extents for the data- and model-based distributions, it appears that the model results might be presented for a larger spatial area than the data-based distribution, which is missing coverage in some areas such as portions of CM 0–0.1. Review the data- and model-based distributions to ensure only cells with data-based NSRs are presented in all three distributions presented in Figures G5-138 to G5-143. This will ensure consistent comparison of model and data. Update the summaries presented in pages 135 and 136 accordingly.	Agree	The text and figures will be revised as appropriate, after reviewing the analysis.	The response is acceptable.
418	Appendix G FMRM	Attachment G-F Section 1.1	1	G.S.107	Attachment G-F, Page 1, Section 1.1 Correlation Analysis of Turbidity and TSS Concentration Data: EPA has previously commented on the TSS–turbidity relationship for the bulkhead sondes as part of the 2016 draft FMRM. Various potential artifacts were identified by EPA that have led to the apparent lack of a relationship between TSS and turbidity. These include fouling of the turbidity sensors, differences in the depth sampled by the turbidity sensor and the TSS water sample collection depth, and location artifacts where the water samples were collected in locations with depths somewhat different than at the sonde locations. Revise the text to mention the potential artifacts that have resulted in an apparent lack of relationship between TSS and turbidity.	Agree	The text will be revised as requested.	The response is acceptable.
419	Appendix G FMRM	Attachment G-F Section 1.1	1	G.S.108	Attachment G-F, Page 1, Section 1.1 Correlation Analysis of Turbidity and TSS Concentration Data, second paragraph, fourth sentence: The referenced sentence states that "a reliable correlation between turbidity and TSS concentration data does not exist." This implies that turbidity measurements cannot be used to infer TSS. This contradicts the implicit assumption behind the analyses in Appendix G, Section 5.3.5, which use ABS-based turbidity as a surrogate for TSS, and infers propwash resuspension, temporal trends in TSS, and the presence of solids classes of varying settling characteristics from the turbidity time-series. If a reliable correlation between turbidity and TSS does not exist as asserted, then ABS-based turbidity cannot defensibly be used to infer TSS and support the parameterization of the propwash resuspension submodel. Reconcile the aforementioned statement with the analyses presented in Appendix G, Section 5.3.5.	Agree	The text will be revised as requested. Also, see response to Comment ID No. 334.	The response is acceptable.
420	Appendix G FMRM	Attachment G-F Section 1.3	5	G.S.109	Attachment G-F, Page 5, Section 1.3 ADV and Near-Bottom Turbidimeter Data Collection and Analysis, last full paragraph, last sentence: The sentence states that the ABS-turbidity correlations were not sufficiently reliable for quantitative use due to the low R2 values. However, this is in contrast to the analyses in Appendix G, Section 5.3.5, which use ABS-based turbidity quantitatively to assess the relative difference in settling velocities and the relative fractions of the two fine sediment classes resuspended by propwash. Reconcile the aforementioned statement with the analyses presented in Appendix G, Section 5.3.5.	Agree	The text will be revised as requested. Also, see response to Comment ID No. 334.	The response is acceptable.
421	Appendix G FMRM	Attachment G-G Section 1.3.14	21	G.S.110	Attachment G-G, Page 21, Section 1.3.14 Phase 1 Core MC001, first paragraph: Based on similar text for other cores, the text in parentheses in the first sentence should appear at the end of the second sentence instead. Review and revise as appropriate.	Agree	The text will be revised as requested.	The response is acceptable.
422	Appendix G FMRM	Table G-H-2	--	G.S.111	Attachment G-H, Table G-H-2: The area-average NSR for Maspeth Creek in Table G-H-2 seems wrong. Comparison to Table G-H-3 suggests that the value in Table G-H-2 is only for Area 1 in Maspeth Creek rather than the entire tributary. Revise the table as appropriate.	Agree	The table will be revised as requested.	The response is acceptable.

Newtown Creek
Remedial Investigation Report[1] Appendix G (FMRM) Comment and Response Matrix

ID No.	Section Name/Topic	Section/Table/ Figure No.	Page No.	Reviewer Comment No.	Comment Text	Category	Response/Proposed Path Forward	EPA Comment (12/16/2019)
423	Appendix G FMRM	Attachment G-H Section 1.2	5	G.S.112	Attachment G-H, Page 5, Section 1.2 Differential Bathymetry Analysis: 1991 to 2012, last paragraph in section: Revise the text to include a discussion and explanation of the erosional signal measured over 1999 to 2012 on average in Area 1 (as seen in Figure G-H-46) and over a significant portion of Area 3 (as seen in Figure G-H-45).	Agree	The text will be revised as requested.	The response is acceptable.
424	Appendix G FMRM	Attachment G-H Section 1.2	5	G.S.113	Attachment G-H, Page 5, Section 1.2 Differential Bathymetry Analysis: 1991 to 2012, last paragraph and Figure G-H-48: As described in the analysis of geochronology data presented in Attachment G-G Section 1.3.14, core MC001, which is located in the vicinity of Area 2, is considered to have been impacted by changes in transport processes (e.g., decreases in point source sediment loads, decreased trapping efficiency due to geomorphic feedback). The existing text in this section discusses only changes in point source loadings as an explanation for the temporal change in NSRs. Revise the text to also discuss potential changes in trapping efficiency as a cause of changing NSRs, similar to the findings in Attachment G-G Section 1.3.14.	Agree	The text will be revised as requested.	The response is acceptable.
425	Appendix G FMRM	Attachment G-H Section 1.2	5	G.S.114	Attachment G-H, Page 5, Section 1.2 Differential Bathymetry Analysis: 1991 to 2012, last paragraph, last sentence: Similar to the impact of changes in trapping efficiency on NSRs noted in several of the geochronology cores presented in Attachment G-G, changes in trapping efficiency may have also impacted NSRs over the 1991 to 1999, and 1999 to 2012 period. It is not clear how changes in NSRs over these two periods can be solely attributed to temporal changes in point source loadings. Revise the text to provide the rationale for attributing changes in NSRs over 1991 to 1999 and 1999 to 2012 solely to temporal changes in point source loadings or include a discussion of changes in trapping efficiency that may have also caused a change in NSR.	Agree	The text will be revised as requested.	The response is acceptable.
426	Appendix G FMRM	Attachment G-I Section 1	1	G.S.115	Attachment G-I, Page 1, Section 1, first paragraph, second sentence: Revise the text to state the implicit assumption involved in this analysis that temporal changes in NSRs during 1991 to 2012 are solely related to changes in point source loadings.	Agree	The text will be revised as requested.	The response is acceptable.
427	Appendix G FMRM	Attachment G-I Section 1	1-2	G.S.116	Attachment G-I, Page 1-2, Section 1, paragraph starting on page 1 and first complete paragraph on page 2, and Figures G-I-2 through G-I-7: The analyses presented for English Kills and East Branch are based on NSRs calculated over the entire tributary rather than Areas 1 to 3 in English Kills and Areas 1 to 4 in East Branch (areas as defined in Attachment G-G). Revise the text to include a note to this effect or revise the analyses and Figures G-I-2 through G-I-7 using the NSRs tabulated in Attachment G-G, Tables G-H-1 and G-H-3. If choosing the latter option, also update Figures G-I-11 through G-I-13.	Agree	The text will be revised to note that the analyses presented for English Kills and East Branch were based on NSRs calculated over the entire tributary.	The response is acceptable.

Note:
1 = *Remedial Investigation Report*, dated April 2019, was submitted to USEPA. Comments were received from USEPA by e-mail on September 19, 2019 at 12:42 p.m. Eastern Time.

Category Key:
Agree: Agree with this comment.
Disagree: Disagree with this comment.

Acronyms:
ABS = acoustic backscatter sensor
ADV = acoustic Doppler velocimeter

CFT = chemical fate and transport
CSO = combined sewer overflow
FMRM = *Final Modeling Results Memorandum*
FS = Feasibility Study
GSD = grain-size distribution
NCG = Newtown Creek Group
NSR = net sedimentation rate
POC = particulate organic carbon
propwash = propeller wash
RI = Remedial Investigation
TOC = total organic carbon
TSS = total suspended solids
USEPA = U.S. Environmental Protection Agency